

# THE MISSOURI WASTE COMPOSITION STUDY



## MUNICIPAL SOLID WASTE

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## MUNICIPAL SOLID WASTE

Phase I

1996

Phase II

1997

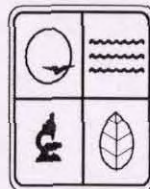
Conducted by:

**MIDWEST ASSISTANCE PROGRAM, Inc.**

The Midwestern Rural Community Assistance Program

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**THE MISSOURI DEPARTMENT OF  
NATURAL RESOURCES**



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## Chapter 1: Introduction

### **What is a waste composition study?**

Solid waste management is one of the most pressing environmental problems that we face today. Our solid waste is rapidly filling up available disposal space, and in some areas causing a disposal crisis. One way to remedy this problem, and in the process conserve our natural resources, is to reduce, reuse, or recycle some of that solid waste. To do this, information is needed on the solid waste stream in order to target waste reduction efforts and programs.

*The Missouri Waste Composition Study* analyzed the composition of the municipal solid waste (MSW) stream throughout the state. Municipal solid waste includes trash from residential, commercial, and institutional sources as well as small generators of industrial trash. By identifying the components of the trash, and their percentage within the municipal waste stream, programs can be designed and implemented to reduce, reuse, or recycle targeted materials.

### **What are some previous and related composition studies?**

A number of waste composition studies provide MSW information for national, state, or local levels of government. The most notable study on waste composition is *The Characterization of Municipal Solid Waste in the United States*, conducted annually by the Franklin Associates, Ltd. These reports (released by the Environmental Protection Agency) characterize the national waste stream based on various data accumulated since 1960. The methodology used is based on production data (by weight) for the materials and products in the waste stream, with adjustments

for imports, exports, and product lifetimes. The results of these studies are used to evaluate current solid waste generation in comparison to past years, and also to project future waste generation rates.

In 1987, the Missouri Environmental Improvement and Energy Resources Authority (EIERA) published the *Statewide Resource Recovery Feasibility and Planning Study*. This study included two seasonal waste sorts at four representative sites around Missouri. The study was the first of its kind in Missouri and established a baseline for further composition studies. One result of the EIERA study was the passage of Senate Bill 530 in 1991.

Two Solid Waste Management Districts, Region D and the Ozark Rivers Solid Waste Management District, have conducted their own waste sorts. Reported findings differed considerably from the 1987 EIERA Study.

Other states have also conducted waste characterization studies. Two studies in particular *The Minnesota Solid Waste Composition Study 1990-92* and *Wisconsin's Solid Waste Composition Manual 1993*, were used as guidelines for planning the *Missouri Waste Composition Study*. Other state composition studies include those from Rhode Island (1990), Michigan (1989), New York (1991), Ohio (1991), Oregon (1992-93), South Dakota (1991), and West Virginia (1991).

### **Why is it important?**

There are many reasons why waste composition studies are performed. The information:

- Provides accurate baseline data needed for solid waste planning and reduction efforts at all levels of government.
- Can be used for planning waste reduction programs and targeting recyclable material available for marketing.
- Can be used to measure the effectiveness of current waste reduction programs.
- Provides needed information for the creation and implementation of future solid waste legislation.
- Can be used by private and municipal recyclers to plan material flows, capacities, revenues, and operating expenses.

National waste characterization studies provide general estimates and predictions of the waste stream, but do not take into consideration specific factors which make the Missouri waste stream different from other regions in the United States. It is also very likely that the results found in the 1987 EIERA study are no longer representative of the current waste stream generated in Missouri. A more encompassing waste study is important in understanding the current composition of Missouri's waste stream and the possibilities for continued waste reduction activities.

Comparisons between the findings in this study and previous studies are examined in Chapter 13. These comparisons show that there has been a change in the composition of the Missouri waste stream since the 1987 EIERA study and differences between other states and the 1994 Franklin and Associates study.



### **What are the Missouri waste reduction laws and goals?**

In 1990, the Missouri General Assembly passed Senate Bill 530. This bill contained legislation pertaining to landfill permitting requirements, set state wide goals for solid waste recovery and reduction, banned certain items from Missouri landfills, set up a solid waste management fund and provided for the development of Solid Waste Management Districts.

The goal set by Senate Bill 530 was a 40% reduction in the statewide waste stream by January 1, 1998. To accomplish this, certain materials were banned from solid waste disposal areas. These products included major appliances (white goods), waste oil, whole tires, lead-acid batteries, and yard waste or clippings. To help meet the waste reduction goal emphasis was placed on reduction and recycling activities at state and local levels of government.

As a result of Senate Bill 530, 20 Solid Waste Management Districts were formed with 113 counties participating. Each District provides technical assistance on solid waste practices and is responsible for assessing solid waste activities within the District. Each assessment is required to have a waste stream analysis for that solid waste management district. A map of the Missouri solid waste management districts is on page 5.

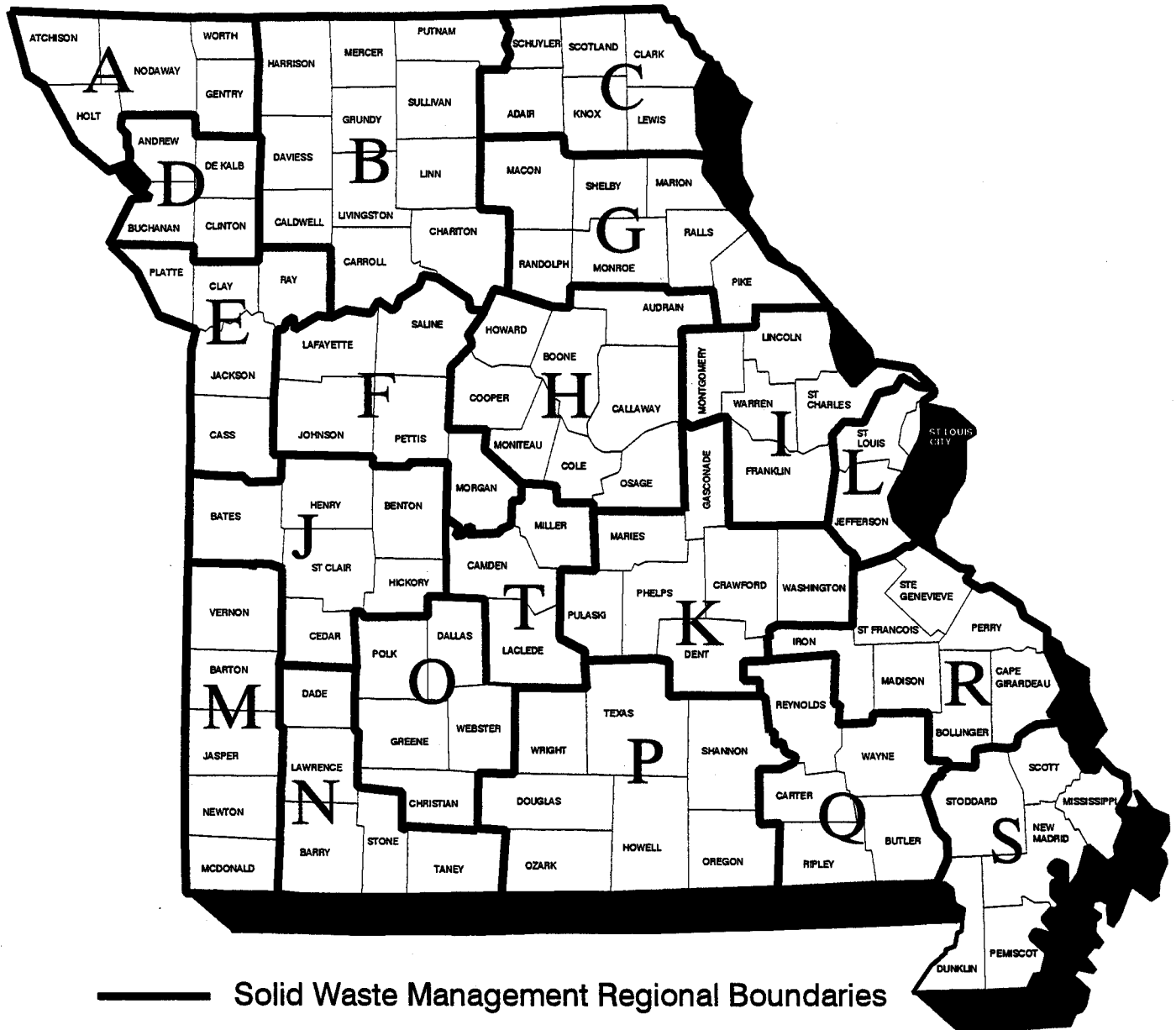
### **How was the Missouri waste composition study funded and implemented?**

*The Missouri Waste Composition Study* was funded through a statewide project grant from the Missouri Department of Natural Resources (MDNR). The Midwest Assistance Program (MAP) developed and implemented the study. MAP is a non-profit organization which provides

environmental technical assistance throughout the Midwest. During Phase I (1996), MAP conducted 29 waste sorts in ten solid waste management districts throughout the state. Three sorts were conducted at each site (one sort was canceled due to poor weather conditions).

During Phase II (1997), 27 additional waste sorts will be conducted in the nine remaining districts (the University of Missouri at Columbia is conducting a separate waste study for the 20<sup>th</sup> district). Waste sorts conducted during both Phase I and II will only examine municipal solid waste. Industrial waste, construction and demolition waste, and special waste streams are not included in this study. The methodology used for this study is discussed in Chapter 2.

# SOLID WASTE MANAGEMENT REGIONS OF MISSOURI



MISSOURI DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF ENVIRONMENTAL QUALITY  
SOLID WASTE MANAGEMENT PROGRAM





## Chapter 2: Methodology

### Introduction

A waste composition analysis is very useful for planning effective solid waste management and recycling programs. Recycling collection, processing, and storage capacities, as well as operation budgets and revenues are all based on estimates of available materials in the waste stream. Therefore, the need for accuracy and statistical relevance in data collection is very important. These aspects were considered when determining the methods, procedures, and statistical analysis to be used for this study. After careful examination of several statewide waste composition studies, the *Minnesota Solid Waste Composition* study was chosen a model for planning the study. SPSS statistical analysis procedures were used to check statistical relevance of the data and will be discussed later in this chapter.

### Selection of waste to be analyzed

For both Phase I and II of the *Missouri Waste Composition Study*, only municipal solid waste (MSW) was examined. According to the EPA's *Characterization of Municipal Solid Waste in the United States: 1994 Update*, MSW can be broken down into five main categories:

- Durable goods (appliances)
- Nondurable goods (newspapers, magazines)
- Containers and packaging. (bottles, cans)
- Organic waste (food scraps and yard trimmings)
- Inorganic wastes (pet litter, dirt)



For the purposes of this study, waste samples did not include wastes from other sources, such as construction and demolition wastes, bulky items, sewage sludge, combustion ash, or industrial process waste. In order to provide consistency throughout the study, only residential waste (single and multi-family dwellings) and light commercial waste (retail businesses, offices, restaurants, institutions, etc.) were selected as the target waste streams for this study. The MSW stream is the target for most municipal and private recycling programs and is normally collected in small containers or plastic garbage bags by municipal or private waste haulers. Bulky items and large durable goods were also excluded due to difficulties in assuring random selection and problems in transportation of the samples to the sorting area. The sampled bagged waste is not the entire waste stream, but it is the largest single component of MSW.

### **Selection of sorting sites**

MAP and the planning staff at MDNR developed criteria used to select waste sort locations. Two main objectives were to select locations that were representative of the waste within that particular district, and to select locations which could be used as a guide for cities outside the district with similar characteristics. In this way, other locations in Missouri could use the data by selecting the site most similar to their demographics. A map of Missouri landfills is on page 9. A map of transfer stations is on page 10. The following locations were selected for Phase I:

City of Springfield Landfill	Teeter's Landfill in Macon
Reeds Spring Transfer Station	City of Maryville Landfill
Pemiscot County Transfer Station	City of Lee's Summit Landfill
St. Francois County Transfer Station	Ellis Scott Landfill in Clinton
City of St. Louis Transfer Station	BFI Landfill in Lamar

Chapters 3 to 12 describe the sort locations and provide the data from those waste sorts.



# Active Sanitary Landfills of Missouri

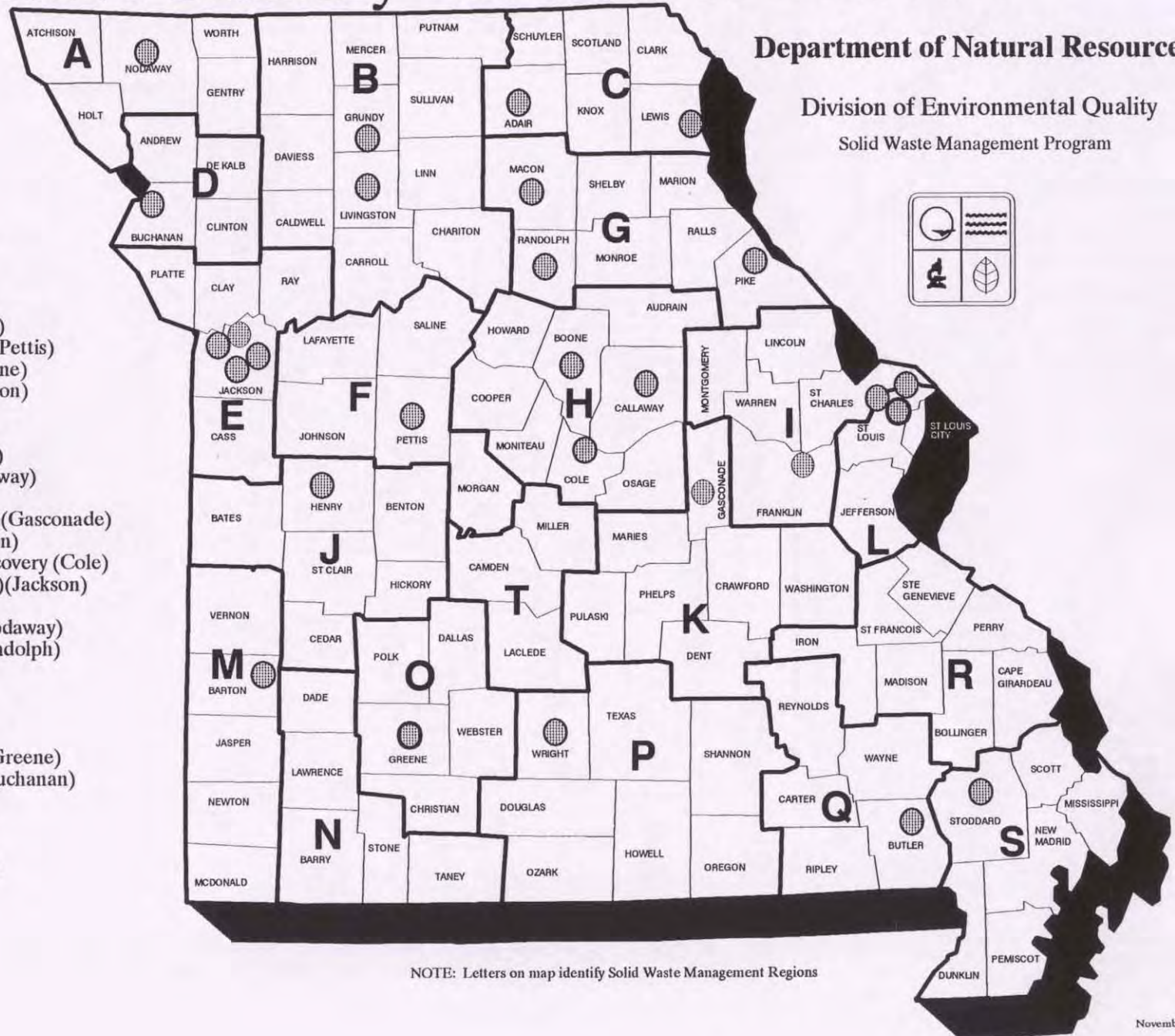
Department of Natural Resources

Division of Environmental Quality

Solid Waste Management Program

## FACILITY (COUNTY)

1. BackRidge (Lewis)
2. Black Oak (Wright)
3. Butler County (private)
4. Central Missouri Inc. (Pettis)
5. City of Columbia (Boone)
6. Courtney Ridge (Jackson)
7. Ellis Scott (Henry)
8. Farmer's (Livingston)
9. Fred Weber (St. Louis)
10. Fulton (City of)(Callaway)
11. Henderson (Grundy)
12. Kahle (Cedar Hollow)(Gasconade)
13. Lamar (City of)(Barton)
14. Land & Resource Recovery (Cole)
15. Lee's Summit (City of)(Jackson)
16. Lemons (Stoddard)
17. Maryville (City of)(Nodaway)
18. Moberly (City of)(Randolph)
19. Northside (Franklin)
20. Rumble (Jackson)
21. Rye Creek (Adair)
22. Southeast (Jackson)
23. Springfield (City of)(Greene)
24. St. Joseph (City of)(Buchanan)
25. Superior (St. Louis)
26. Sutton & Sons (Pike)
27. Teter (Macon)
28. West Lake (St. Louis)





# Active Transfer Stations of Missouri

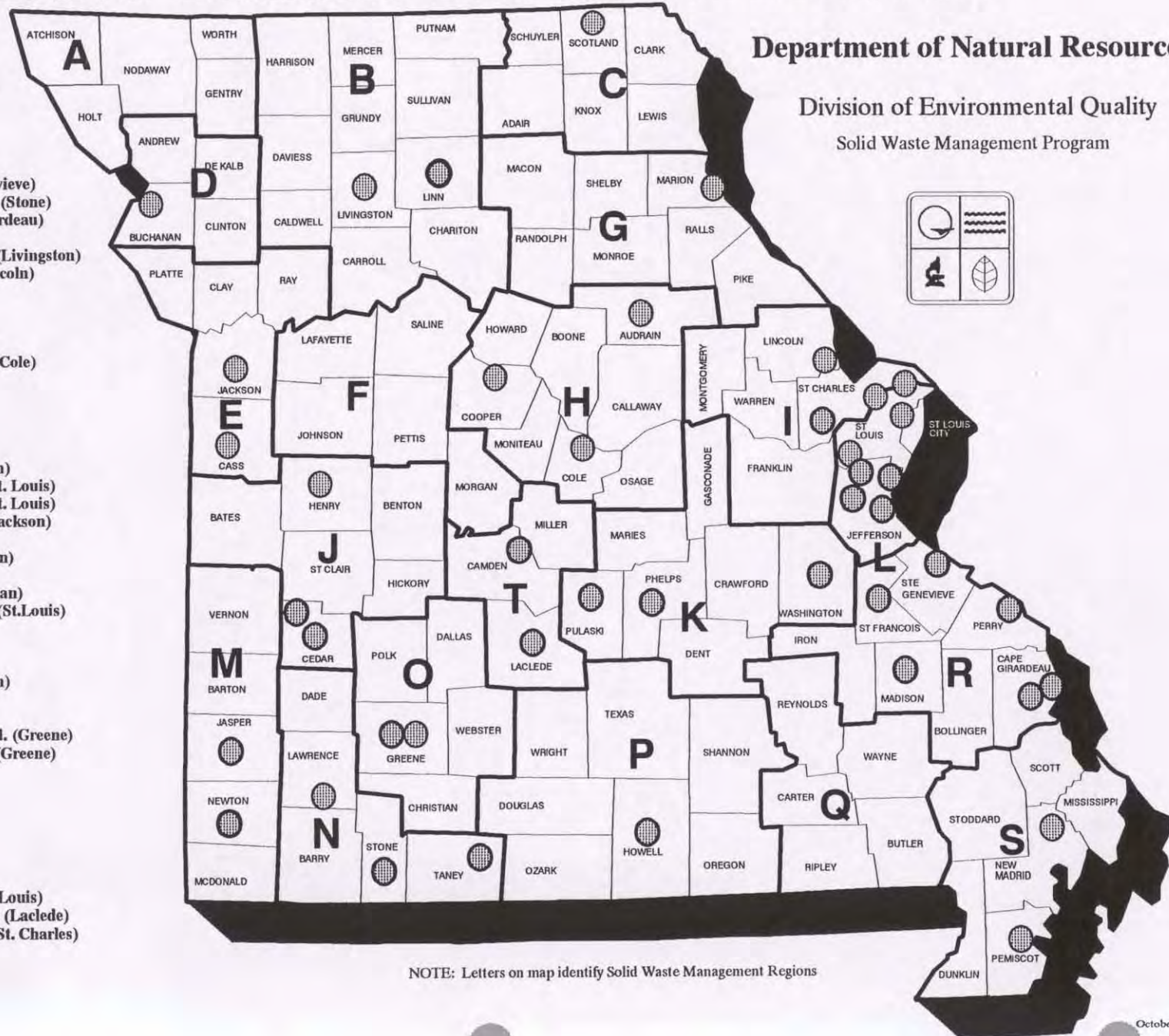
Department of Natural Resources

Division of Environmental Quality

Solid Waste Management Program

## FACILITY (COUNTY)

1. CWI of Missouri (Ste. Genevieve)
2. American Disposal Services (Stone)
3. Cape Girardeau (Cape Girardeau)
4. Cass County
5. Chillicothe Municipal Util. (Livingston)
6. Christian Disposal Inc. (Lincoln)
7. City of Boonville (Cooper)
8. City of Mexico (Audrain)
9. Clinton Municipal (Henry)
10. El Dorado Springs (Cedar)
11. Environmental Sanitation (Cole)
12. Fredericktown (Madison)
13. Gilliam (Washington)
14. J.T. Brown Ent. (Marion)
15. Jackson (Cape Girardeau)
16. Jefferson County
17. Kraemer Hauling (Jefferson)
18. Laidlaw-St. Louis-North (St. Louis)
19. Laidlaw-St. Louis-South (St. Louis)
20. Longview of Kansas City (Jackson)
21. M. S., Inc. (Camden)
22. Meramec Hauling (Jefferson)
23. Neosho (Newton)
24. Norris & Son, Inc. (Buchanan)
25. North American Recycling (St. Louis)
26. Pemiscot County
27. Perry County
28. Phelps County
29. Reliable Disposal (Jefferson)
30. Scotland County
31. Sonny's (New Madrid)
32. Springfield City Refuse, Ltd. (Greene)
33. Springfield Relay Systems (Greene)
34. St. Francois County
35. St. Robert (Pulaski)
36. Stockton Lake (Cedar)
37. Sunray Services (Jasper)
38. Taney County
39. Tate's (Lawrence)
40. Teter (Linn)
41. University City Refuse (St. Louis)
42. Waste Mgmt. of the Ozarks (Laclede)
43. Waste Mgmt. of St. Louis (St. Charles)
44. West Plains (Howell)





### **Selection of seasonal sorting dates**

Waste streams can change considerably during different times of the year. Tourism, growing seasons, and temperature changes can all play a factor in the quantity and composition of a waste stream. This study wanted to account for this change by conducting seasonal sorts. Sorting dates were scheduled so that each site would have three seasonal sorts: first round (February-April), second round (May-July), and the third round (September-November). Each sort was scheduled to last three days. Since the types of MSW generated during and immediately after holidays tend to be different from MSW generated during other times of the year, sorts were not scheduled between mid November and mid January.

### **Selection of sorting categories**

In selecting sort categories MAP and MDNR reviewed previous waste composition studies, analyzed recycled material markets, and consulted with several solid waste planners. Sort categories were selected based on the following criteria:

- Consistent with other state and federal studies for comparison purposes.
- Present in most samples of MSW.
- Specific enough to help with the evaluation of recycling and reduction potential.
- General enough to be able to sort samples in a reasonable period of time
- Convenient and practical for random selection and transportation to and from the sort facility.

The following pages contain a list of categories and sub-categories selected for this study.



## PAPER

**Cardboard and Kraft Paper-** Non waxed corrugated cardboard (OCC) box board, and Kraft paper. Examples: corrugated boxes, cereal boxes and grocery sacks.

**Newsprint-** Printed groundwood paper. Examples: newspapers and glossy advertisements typically found in newspapers.

**Magazines-** Periodicals, or bound printed material that is intended to be discarded after a certain date. Examples: glossy magazines, catalogs and phone books.

**High Grade Paper-** Paper that is recyclable and consistently has a positive market value (normally found in offices). Examples: bond computer paper, index cards, notebook paper, xerographic and typing paper, yellow tablets, manila file folders, fax paper and white cash register receipts.

**Mixed Paper-** All paper that does not fit into the categories specified above (Newsprint, High Grade Paper, Cardboard and Kraftpaper, and Magazines). Examples: construction paper, books, tissue paper, waxed paper, carbon paper, non-corrugated paperboard, groundwood computer paper, paper with tape or adhesives, envelopes with windows, paper cups, paper plates and tablets with colored glue binding.

## GLASS

**Clear Glass Containers-** Clear glass which originally contained food or beverage. Examples: primarily soft drink and food containers, clear beer containers.

**Brown Glass Containers-** Brown glass which originally contained food or beverages. Examples: containers for beer, light-sensitive chemicals and drugs.

**Green and Blue Glass Containers-** Green or blue cast glass which originally contained food or beverage. Example: soft drink and wine containers.

**Other Glass-** All glass that was not originally a food or beverage container and glass broken beyond recognition. Examples: window glass, mirrors, light bulbs, windshields, fragrance bottles and fragments.

## METALS

**Aluminum Cans-** All aluminum beverage containers.

**Other Aluminum-** All aluminum except beverage containers. Examples: aluminum foil, aluminum lawn chairs, aluminum wrappers and all other recognizable aluminum.

**Ferrous Food Cans-** Any steel food containers, including ferrous pet food cans. (Empty aerosol cans and empty paint cans were also included in this category).

**Other Ferrous-** Ferrous and alloyed ferrous scrap to which a magnet attracted. Examples: some metal appliances, wire hangers, commercial or industrial products, nuts and bolts, electrical motors.

**Other Non-Ferrous-** All nonmagnetic metals that are not recognizable as aluminum.

**Oil Filters-** Used and new oil filters for automobiles.



## PLASTICS

**PET (#1)-** Beverage bottles composed of polyethylene terephthalate with or without an HDPE base cup. Also includes other containers clearly labeled PET (#1). Examples: pop bottles, some dishwashing soaps, honey, liquor and toiletries.

**HDPE (#2)-** High density polyethylene containers. Examples: jugs and bottles for detergent, dairy products, windshield fluid containers, some medicine containers, motor oil and shampoo.

**Plastic Film-** Includes all flexible plastic film regardless of resin content. Examples: garbage bags, bread bags, snack bags, plastic grocery bags, food wrappings and shrink wrap.

**Other Plastic-** Includes: PVC (#3), LDPE (#4), PP (#5), PS (#6), other plastics or mixed resins (#7), and unidentifiable plastics. Examples: plastic bottle caps, 6-pack rings, brick pack juice boxes, squeezable bottles, individual condiment containers, dairy tubs, mouthwash bottles, styrofoam and blister packs.

## ORGANICS

**Food Waste-** Putrescibles. Material capable of being decomposed by microorganisms with sufficient rapidity as to cause nuisances from odors and gases. Examples: kitchen waste, other food, waste parts from butchered animals and dead animals

**Wood Waste-** Includes wooden furniture, wooden tool handles, boards, plywood and particle board.

**Textiles-** All woven fabric, natural or synthetic, either in bulk or made into usable items. Examples: clothing, carpet, curtains, linens, rugs, canvas bags and fabric.

**Disposable Diapers-** Adult or infant disposable diapers, clean or soiled.

**Other Organics-** Those items which do not fall into any other category and which are composed of carbon-based material. Carbon-based material includes those items made of natural substances which, when left exposed to the natural elements, would eventually decompose. Examples: leather, rubber, baskets, furniture of willow or bamboo, hair, shoes, feminine protection items, cotton balls, and inseparable organic composite items.

## INORGANICS

**Fines-** All matter not sorted into specific categories which are too small or mixed to be categorized. Usually the remaining remnants of the sort. Examples: coffee grounds, rocks, dirt, ceramics and kitty litter (clay), cigarette butts, small bits of paper, and dirt.

**Other Inorganics-** Those items which do not fall into any other category and which are composed of inert materials which would not decompose when left exposed to the natural elements.



Items that were considered unusual or possibly hazardous were kept apart from the above categories. At the end of each sort, these items were collected on a table and listed separately from the regular data. Most of these items could be grouped together into sub categories. Listings of these items found during each sort are located in later chapters. The following list describes the types of items found in the sub categories:

## **OTHER WASTE**

**Over-the-Counter Medicine (OTC)-** Medication bought over the counter. Examples: vitamins, antacid, aspirin, cold medicine.

**Prescription Medication (Rx)-** Medication requiring a prescription. Examples: oral contraceptives, prescription inhalants, perspiration ointments, vaccinations (human or animal).

**Beauty/hygiene products-** Items used for cosmetic or hygiene purposes. Examples: soap, shampoo, cosmetics, hair gel, deodorant, toothpaste, mouthwash, perfume/cologne, etc.

**Beauty/hygiene aerosol products-** Items in an aerosol can used for hygiene purposes. Examples: shaving cream, hair spray, deodorant.

**Household cleaning products-** Products used for cleaning items in a household. Examples: silver cleaner, floor wax, furniture oil, all-purpose chemical cleaners, bleach, dishwashing detergent, etc.

**Household cleaning aerosol products-** Products used for household cleaning in aerosol containers. Examples: furniture polish, oven cleaner, some glass cleaners, etc.

**Aerosol Cans-** Aerosol cans containing product. Examples: spray paint, some glues, air freshners.

**Sharps/Blades-** Items with sharp edges that could cause harm if handled improperly. Examples: knives, blades from utility knives, saws.

### **Syringes and Needles**

**Hardware/Shop products-** Items used for home improvement projects or building projects. Examples: rubber cement, caulking, wood stain, paint thinner, glue.

**Gardening/Yard products-** Items used for garden and lawn care and maintenance. Example: pesticides, plant food, garden chemicals, water treatment chemicals.

### **Disposable razors**

### **Alkaline batteries**

**Miscellaneous items-** Unusual items which could be harmful or toxic but do not belong in any of the above categories. Items will be listed separately for this category.

### **Procedure for selecting loads**

Prior to conducting a sort, MAP staff consulted with the district planner and the facility manager of each site for their input into the type of waste received at the facility. All samples were taken from licensed local trash haulers who served residential and commercial customers. MAP staff did not sample waste from roll-off containers, transfer trailers, homogeneous industrial waste, construction and demolition wastes, bulky items, and toxic or special wastes.

Waste haulers entering the landfill or transfer station were chosen at random and interviewed to determine eligibility of their load. If the load met the sampling criteria listed above, the driver was asked to identify his company, the geographical origin of the waste, and the estimated percentage of residential and light commercial waste.

### **Procedure for selecting samples**

After the hauler emptied their load, the MAP project manager selected a sample. Research from various waste analysis studies indicated that the size of a sample should be between 200 and 250 pounds. Normally 20 to 25 bags of waste would satisfy the weight criteria. Random selection was accomplished by taking bags from all sides of the pile after it was unloaded by the waste hauler. The MAP project manager selected every sample from every sort. This provided consistency and insured random selection throughout phase I. Each sample was sorted, weighed, and recorded separately on the data sheet used to interview the waste hauler. Other factors recorded on the data sheet included weather conditions, sorting conditions, and unusual materials found in the sample. Only one sample was taken from each selected hauler except at low traffic sites. The sample was loaded onto a trailer and transported to the sort area.



For the first round of sorts, 14 to 16 samples were collected at each site. However, only 12 samples were collected at each site during the second and third round of sorts. Statistical evaluation revealed that the number of samples needed could be lowered from 16 to 12 while still maintaining statistical relevance.

### **Sorting Procedure**

A sorting tent was set up at each site to provide shelter from the weather during the sorting process. The sort facility consisted of a 12-person military tent used to house equipment and tables. General equipment used during the sorts included category containers (20 gallon garbage containers), personal protective equipment (gloves, tyvek suites, boots, masks, etc.), portable heaters and/or fans, lights, a portable electric generator, tools used for sorting (linoleum knives, hand cultivators, shovels, brooms, etc.), and a portable scale used for measuring the weight for each category.

Temporary workers were hired at each site to assist with the sort. The sorters were required to attend a training class (taught by the MAP sort supervisor) prior to the sort. During this class sorting procedures, types of waste categories, and safety guidelines were explained. Personal protective equipment for each sorter (tyvek suites, neoprene gloves and cotton liners, and steel-toed boots) was provided by MAP and was required garb during sorting activities.

### **First Round Procedure**

The following procedure was used for the first round of sorts. The sample was selected, and transported to the sort facility which was set up as close as possible to the tipping area. Two

sorting tables were set up adjacent to the tent with a sample placed on each table. The entire sample was pre-sorted by the project manager and the sort supervisor. Pre-sorting (emptying all the bags on the sorting table to scan the contents) was performed to remove any potentially hazardous materials before normal sorting procedures began. The presorting proved to be an unnecessary step.

Once pre-sorting was completed, the sorters would begin by placing the waste into its assigned category container. When sorters came across items belonging in the "Other Waste" category, they would alert the sort supervisor, who removed it from the table. The entire sample was separated and the materials were placed into the appropriate containers. The "fines" were swept to the end of the table and collected. The containers were weighed, the weight and estimated volumes for each category were recorded on the data sheet. Once the categories were measured and recorded, the containers were carried back to the tipping area or emptied into a large dumpster provided by the operating facility. This procedure was repeated, one sample at a time, until all samples had been categorized, weighed, and recorded.

All waste was sorted into identical 20 gallon plastic containers which weighed 5.5 pounds each. An *accu-weigh* top loaded spring scale was used to weigh all containers. The volume of each container was approximately 3 cubic feet. Volume estimates were recorded when each container was weighed.



## **Second and Third Round Procedure**

The following modifications were made to the sorting procedure after the first round of sorts. The number of samples for each site was reduced from 16 to 12 and only one table was used for sorting purposes, reducing the number of sorters needed for each sort from four to two. This lengthened the sorting time at each site but increased the accuracy. The sorting tent was set up away from the tipping area and a trailer was added to transport samples to and from the sorting tent. This provided a safer and more protected environment for the sorting crew.

Presorting was eliminated because very little dangerous materials were found in the first round and wind gusts blew lighter materials off the table. During the second and third rounds, sorters were instructed to open one bag of the sample at a time and sort the waste directly from the bag, into the appropriate containers, until all the contents were categorized. When one bag was finished, the sorter would pick another bag from the sample and continue with the same sorting procedure until all bags from that sample were sorted. A safety demonstration was added to the training session to show sorters how to correctly sort from the bag. These changes in the sorting procedure made sorting activities cleaner, more accurate, and more efficient. These changes were used for all sorts conducted during the second and third rounds.

## **Statistical Relevance**

In addition to the concerns for random sampling and accurate data collection, there is also a need to show how relevant the sample means were to the actual population means. For each sample taken, the total weights (in pounds), estimated volumes (in cubic feet), mean (average) weight and volume, and the percentage of weights and volumes for each category and subcategory were



calculated. By using these figures, statistical significance and relevance were calculated for each sort.

Using an SPSS statistical program, the data from each category and subcategory was converted into percentages of the total weight. These percentages were then used to calculate statistical significance and confidence intervals for each site overall. The confidence level for this study was set at 95%. This means that there is a 95% chance that the randomly selected samples will fall within a certain range.

The significance test was also calculated for each category and subcategory. Statistical significance showed the likelihood that the sample means were close enough to the actual population means to make inferences about its composition. For this study, significance was achieved if the significance test yielded a probability of .05 or less. All samples examined during Phase I proved to be significant. This means that there is a 1 in 20 chance (or less) that a random sample will not fall within the actual population mean.

The statistical results for each sort and the summary of statistical results for each location are listed in each chapter. Statistical results include:

- The estimated weight of MSW that was collected at the site during the sampling period.
- The total pounds sampled during each sort.
- The total number of samples collected.
- The significance results.
- Mean sample, in pounds, and confidence interval at the 95% level (summary results only).



The mean weight for all samples fell within the 95% confidence level and are significant. The margin of error varied between 2-7% dependent on the material sampled and the sample size. This data is available upon request from MAP.

## Chapter 3: Springfield

### COMMUNITY PROFILE

Springfield is the third largest city in Missouri. It is the county seat of Greene County and is a member of Solid Waste Management District "O". The City has a large industrial base, and is a regional service and retail center for several surrounding counties. Springfield is also the home of Southwest Missouri State University, several private universities, and the world headquarters for the Assembly of God Church.

Springfield is located on Interstate 44. It is 215 miles southwest of St. Louis and 167 miles southeast of Kansas City.

#### Demographics:

	Springfield	Greene County
Area (sq. miles)	68	675
Population (1992)	145,438	215,072
Density (per sq. mile)	2,139	319
Pop. Change since 1980	9.3%	16.1%
Number of households	57,353	81,463
Persons per household	2.28	2.43
High school graduates	77.0%	78.9%
Median Family Income	\$27,705	\$30,153
Percent below poverty level	17.8%	9.2%



### **Solid waste collection**

Solid waste is collected by several private waste haulers in Springfield. The City licenses the haulers but does not franchise or set up collection zones. All waste haulers are required to offer curbside recycling but residents are not required to recycle.

### **Solid waste disposal**

The City of Springfield owns and operates its own landfill, which is located north of the city on Highway 13. They receive approximately 140,000 tons of waste per year. The current tipping fee at the landfill is \$27.50 per ton. Two private haulers, Waste Management and BFI, own and operate transfer stations within the city limits. Waste management sends most of their waste to their own landfill in Hartsville, Missouri and BFI sends a large portion of their waste to their landfill in Lamar Missouri.

### **Waste reduction and recycling programs**

Springfield has an active recycling and waste reduction program. Four drop-off sites were established throughout the city to collect recyclable materials, and all licensed trash haulers in Springfield offer curbside collection of recyclables. In 1995, 5800 tons of recyclables were collected through the drop-off and curbside programs.

Springfield also operates a composting site and a household chemical collection center. The city offers many education programs to area businesses and schools in an effort to increase community awareness of waste reduction.

### **Springfield Results**

Information about sample size and composition are listed in tables 3-1 through 3-8.

**All weights are listed in pounds and all volumes are in cubic feet.**



## **SORT #1**

### **Sort Conditions**

The first sort was conducted February 7th through the 9th. A surface close to the tipping area was leveled and covered with gravel for an even surface to set up the sort facility. The weather for all days was sunny and mild, with moderate winds.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	188,000
<b>Total Sample Weight (lbs)</b>	2,654
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	14

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	0	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	1	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	4	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	0	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	0
<b>Syringes</b>	19	<b>Alkaline Batteries</b>	22
<b>Hardware/Shop Products</b>	8	<b>Automobile Maintenance/Cleaning Products</b>	1
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> 1 quart of latex paint, 1 18" florescent tube.			



# SPRINGFIELD

## SORT #1

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	228.0	54.8	100%	0%	Curbside and drop-off	Northwest Springfield
2	263.0	52.6	100%	0%	Curbside and drop-off	Southwest Springfield
3	163.0	54.2	95%	5%	Curbside and drop-off	East Springfield
4	196.0	47.1	99%	1%	Curbside and drop-off	Springfield
5	145.0	36.1	75%	25%	Curbside and drop-off	Springfield
6	171.0	51.7	80%	20%	Curbside and drop-off	Central Springfield
7	145.0	41.0	100%	0%	Curbside and drop-off	North Springfield
8	153.0	37.0	75%	25%	Curbside and drop-off	Southwest Springfield
9	185.0	52.0	100%	0%	Curbside and drop-off	North Springfield
10	196.0	48.6	95%	5%	Curbside and drop-off	Southeast Springfield
11	230.0	56.4	100%	0%	Curbside and drop-off	Springfield
12	230.0	60.1	80%	20%	Curbside and drop-off	Springfield
13	178.0	44.7	100%	0%	Curbside and drop-off	North Springfield
14	171.0	65.4	100%	0%	Curbside and drop-off	Southwest Springfield
<b>TOTALS</b>	<b>2654.0</b>	<b>701.7</b>				
<b>AVERAGE</b>	<b>189.6</b>	<b>50.1</b>	<b>93%</b>	<b>7%</b>		

TABLE 3-1

CATEGORY	SPRINGFIELD				SORT #1	
	TOTALS		AVERAGE		PERCENTAGE	
	Wt.	Vol.	Wt.	Vol.	Pct. by wt.	Pct. by vol.
Cardboard	234.9	117.7	16.8	8.4	8.85%	16.78%
Newsprint	235.0	35.2	16.8	2.5	8.86%	5.02%
Magazines	68.5	11.2	4.9	0.8	2.58%	1.60%
High Grade	25.9	8.1	1.9	0.6	0.98%	1.15%
Mixed	633.6	163.5	45.3	11.7	23.88%	23.31%
<b>PAPER TOTALS</b>	<b>1197.9</b>	<b>335.7</b>	<b>85.6</b>	<b>24.0</b>	<b>45.14%</b>	<b>47.86%</b>
Clear	111.5	14.5	8.0	1.0	4.20%	2.07%
Brown	14.7	2.1	1.1	0.2	0.55%	0.30%
Green	1.0	0.2	0.1	0.0	0.04%	0.02%
Other	4.1	0.3	0.3	0.0	0.15%	0.04%
<b>GLASS TOTALS</b>	<b>131.3</b>	<b>17.1</b>	<b>9.4</b>	<b>1.2</b>	<b>4.95%</b>	<b>2.43%</b>
Alum. Cans	24.8	9.5	1.8	0.7	0.93%	1.35%
Other Alum	13.3	4.1	0.9	0.3	0.50%	0.59%
Non ferrous	0.5	0.0	0.0	0.0	0.02%	0.00%
Food Cans	126.0	24.5	9.0	1.8	4.75%	3.49%
Ferrous	14.5	2.6	1.0	0.2	0.55%	0.37%
Oil Filters	1.0	0.1	0.1	0.0	0.04%	0.01%
<b>METAL TOTALS</b>	<b>180.0</b>	<b>40.8</b>	<b>12.9</b>	<b>2.9</b>	<b>6.78%</b>	<b>5.82%</b>
PET # 1	55.9	39.8	4.0	2.8	2.11%	5.67%
HDPE # 2	52.3	36.4	3.7	2.6	1.97%	5.18%
Film	138.2	66.5	9.9	4.7	5.21%	9.47%
Other Plastic	121.9	73.5	8.7	5.3	4.59%	10.48%
<b>PLASTIC TOTALS</b>	<b>368.3</b>	<b>216.1</b>	<b>26.3</b>	<b>15.4</b>	<b>13.88%</b>	<b>30.80%</b>
Food Waste	380.1	24.0	27.2	1.7	14.33%	3.42%
Wood Waste	31.6	4.0	2.3	0.3	1.19%	0.56%
Textiles	105.9	31.6	7.6	2.3	3.99%	4.51%
Diapers	100.6	13.5	7.2	1.0	3.79%	1.92%
Other Organics	27.2	6.8	1.9	0.5	1.03%	0.97%
<b>ORGANIC TOTALS</b>	<b>645.4</b>	<b>79.9</b>	<b>46.1</b>	<b>5.7</b>	<b>24.32%</b>	<b>11.39%</b>
Fines	105.0	9.4	7.5	0.7	3.96%	1.33%
Other Inorganics	25.6	2.6	1.8	0.2	0.96%	0.36%
<b>INORGANIC TOTAL</b>	<b>130.6</b>	<b>11.9</b>	<b>9.3</b>	<b>0.9</b>	<b>4.92%</b>	<b>1.70%</b>
<b>TOTAL SORT</b>	<b>2653.4</b>	<b>701.4</b>	<b>189.5</b>	<b>50.1</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 3-2







## **SORT # 2**

### **Sort Conditions**

The second sort was conducted May 12th through the 14th. The sort facility was set up approximately 300 yards from the tipping area. The sorting procedure used in the first round was also used for this sort. The first day of sorting activities was canceled after two samples due to heavy rain, and the second day of sorting was canceled after four samples when several sorters became ill due to excessive methane gas in the sorting area.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	188,000
<b>Total Sample Weight (lbs)</b>	1,824.5
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	6

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	3	<b>Beauty/Hygiene Aerosol Products</b>	6
<b>Prescription Medication (Rx)</b>	1	<b>Household Cleaning Aerosol Products</b>	2
<b>Beauty/Hygiene Products</b>	7	<b>Gardening/Yard Care Products</b>	6
<b>Household Cleaning Products</b>	8	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	2	<b>Disposable Razors</b>	4
<b>Syringes</b>	7	<b>Alkaline Batteries</b>	0
<b>Hardware/Shop Products</b>	4	<b>Automobile Maintenance/Cleaning Products</b>	2
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> Vinyl sheet with insecticide in it.			



## SPRINGFIELD SORT #2

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	309.0	52.2	98%	2%	Curbside and Drop-off	City of Springfield
2	299.0	45.0	100%	0%	Curbside and Drop-off	City of Springfield
3	305.0	59.9	100%	0%	Curbside and Drop-off	City of Springfield
4	243.5	48.9	100%	0%	Curbside and Drop-off	City of Springfield
5	288.0	47.5	100%	0%	Curbside and Drop-off	City of Springfield
6	380.0	56.5	100%	0%	Curbside and Drop-off	City of Springfield
<b>TOTALS</b>	<b>1824.5</b>	<b>310.0</b>				
<b>AVERAGE</b>	<b>304.1</b>	<b>51.7</b>	<b>99%</b>	<b>1%</b>		

CATEGORY	SPRINGFIELD				SORT # 2	
	TOTALS		AVERAGE		PERCENTAGE	
	Wt.	Vol.	Wt.	Vol.	Pct. by wt.	Pct. by vol.
Cardboard	115.5	38.5	19.3	6.4	6.33%	12.42%
Newsprint	210.0	20.0	35.0	3.3	11.52%	6.45%
Magazines	44.5	4.6	7.4	0.8	2.44%	1.48%
High Grade	15.5	3.2	2.6	0.5	0.85%	1.02%
Mixed	259.5	42.8	43.3	7.1	14.23%	13.79%
<b>PAPER TOTALS</b>	<b>645.0</b>	<b>109.0</b>	<b>107.5</b>	<b>18.2</b>	<b>35.37%</b>	<b>35.17%</b>
Clear	46.5	3.8	7.8	0.6	2.55%	1.23%
Brown	45.5	6.0	7.6	1.0	2.50%	1.92%
Green	9.0	0.8	1.5	0.1	0.49%	0.26%
Other	15.5	0.9	2.6	0.2	0.85%	0.29%
<b>GLASS TOTALS</b>	<b>116.5</b>	<b>11.5</b>	<b>19.4</b>	<b>1.9</b>	<b>6.39%</b>	<b>3.69%</b>
Alum. Cans	21.3	9.8	3.6	1.6	1.17%	3.15%
Other Alum	14.0	3.5	2.3	0.6	0.77%	1.13%
Non ferrous	0.0	0.0	0.0	0.0	0.00%	0.00%
Food Cans	54.0	10.3	9.0	1.7	2.96%	3.31%
Ferrous	19.0	2.8	3.2	0.5	1.04%	0.89%
Oil Filters	5.0	0.3	0.8	0.1	0.27%	0.10%
<b>METAL TOTALS</b>	<b>113.3</b>	<b>26.6</b>	<b>18.9</b>	<b>4.4</b>	<b>6.21%</b>	<b>8.57%</b>
PET # 1	34.0	17.8	5.7	3.0	1.86%	5.73%
HDPE # 2	37.0	21.0	6.2	3.5	2.03%	6.78%
Film	63.0	21.0	10.5	3.5	3.45%	6.78%
Other Plastic	107.0	38.2	17.8	6.4	5.87%	12.33%
<b>PLASTIC TOTALS</b>	<b>241.0</b>	<b>98.0</b>	<b>40.2</b>	<b>16.3</b>	<b>13.22%</b>	<b>31.61%</b>
Food Waste	336.0	23.0	56.0	3.8	18.43%	7.42%
Wood Waste	21.0	2.4	3.5	0.4	1.15%	0.77%
Textiles	68.5	10.5	11.4	1.8	3.76%	3.39%
Diapers	100.5	11.0	16.8	1.8	5.51%	3.55%
Other Organics	53.5	7.1	8.9	1.2	2.93%	2.27%
<b>ORGANIC TOTALS</b>	<b>579.5</b>	<b>54.0</b>	<b>96.6</b>	<b>9.0</b>	<b>31.78%</b>	<b>17.41%</b>
Fines	97.2	9.0	16.2	1.5	5.33%	2.90%
Other Inorganics	31.0	2.0	5.2	0.3	1.70%	0.65%
<b>INORGANIC TOTAL</b>	<b>128.2</b>	<b>11.0</b>	<b>21.4</b>	<b>1.8</b>	<b>7.03%</b>	<b>3.55%</b>
<b>TOTAL SORT</b>	<b>1823.5</b>	<b>309.9</b>	<b>303.9</b>	<b>51.7</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 3-4







### **SORT # 3**

#### **Sort Conditions**

The third sort was conducted September 9th through the 11th. The sort facility was set up approximately 300 yards from the tipping area. The weather conditions were sunny and mild for all scheduled sorting days.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	188,000
Total Sample Weight (lbs)	2,599.2
Significance Test Results	.000
Number of Samples	12

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	4	Beauty/Hygiene Aerosol Products	3
Prescription Medication (Rx)	4	Household Cleaning Aerosol Products	2
Beauty/Hygiene Products	5	Gardening/Yard Care Products	1
Household Cleaning Products	3	Pet Groom Products	1
Sharps/Blades	0	Disposable Razors	5
Syringes	5	Alkaline Batteries	8
Hardware/Shop Products	3	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	1		
Miscellaneous items: Full bingo marker, 1 thermometer.			



# **SPRINGFIELD** **SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	190.0	43.8	0%	100%	Curbside/Drop-off	Springfield/ west end
2	149.0	37.3	99%	1%	Curbside/Drop-off	Springfield/ north
3	255.0	64.1	85%	15%	Curbside/Drop-off	Springfield/ south
4	262.0	57.4	100%	0%	Curbside/Drop-off	Springfield/ north and west
5	252.7	56.1	100%	0%	Curbside/Drop-off	Springfield/ north
6	207.0	39.3	10%	90%	Curbside/Drop-off	Springfield/ central
7	257.0	45.2	100%	0%	Curbside/Drop-off	Springfield
8	185.0	50.3	70%	30%	Curbside/Drop-off	Springfield/ central and wes
9	191.0	26.8	50%	50%	Curbside/Drop-off	Springfield/ north
10	234.0	37.1	100%	0%	Curbside/Drop-off	Springfield/ central
11	234.0	45.6	100%	0%	Curbside/Drop-off	Springfield/ north
12	182.5	32.4	100%	0%	Curbside/Drop-off	Springfield/ west
<b>TOTALS</b>	<b>2599.2</b>	<b>535.4</b>				
<b>AVERAGE</b>	<b>216.6</b>	<b>44.6</b>	<b>76%</b>	<b>24%</b>		

TABLE 3-5

CATEGORY	SPRINGFIELD				SORT # 3	
	TOTALS		AVERAGE		PERCENTAGE	
	Wt.	Vol.	Wt.	Vol.	Pct. by wt.	Pct. by vol.
Cardboard	173.0	67.5	14.4	5.6	6.66%	12.61%
Newsprint	229.0	31.3	19.1	2.6	8.82%	5.85%
Magazines	71.0	8.9	5.9	0.7	2.73%	1.66%
High Grade	86.5	12.5	7.2	1.0	3.33%	2.33%
Mixed	400.0	96.1	33.3	8.0	15.41%	17.95%
<b>PAPER TOTALS</b>	<b>959.5</b>	<b>216.3</b>	<b>80.0</b>	<b>18.0</b>	<b>36.96%</b>	<b>40.40%</b>
Clear	61.5	5.5	5.1	0.5	2.37%	1.03%
Brown	37.5	2.9	3.1	0.2	1.44%	0.54%
Green	15.0	1.6	1.3	0.1	0.58%	0.30%
Other	9.0	0.8	0.8	0.1	0.35%	0.15%
<b>GLASS TOTALS</b>	<b>123.0</b>	<b>10.8</b>	<b>10.3</b>	<b>0.9</b>	<b>4.74%</b>	<b>2.02%</b>
Alum. Cans	49.5	16.4	4.1	1.4	1.91%	3.06%
Other Alum	22.5	2.7	1.9	0.2	0.87%	0.50%
Non ferrous	4.0	0.9	0.3	0.1	0.15%	0.17%
Food Cans	102.5	17.8	8.5	1.5	3.95%	3.32%
Ferrous	42.0	4.1	3.5	0.3	1.62%	0.77%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>220.5</b>	<b>41.9</b>	<b>18.4</b>	<b>3.5</b>	<b>8.49%</b>	<b>7.83%</b>
PET # 1	68.0	28.2	5.7	2.4	2.62%	5.27%
HDPE # 2	71.5	31.0	6.0	2.6	2.75%	5.79%
Film	86.7	42.0	7.2	3.5	3.34%	7.84%
Other Plastic	188.0	49.3	15.7	4.1	7.24%	9.21%
<b>PLASTIC TOTALS</b>	<b>414.2</b>	<b>150.5</b>	<b>34.5</b>	<b>12.5</b>	<b>15.95%</b>	<b>28.11%</b>
Food Waste	474.5	48.6	39.5	4.1	18.28%	9.08%
Wood Waste	21.0	2.4	1.8	0.2	0.81%	0.45%
Textiles	84.0	11.8	7.0	1.0	3.24%	2.20%
Diapers	66.5	7.2	5.5	0.6	2.56%	1.34%
Other Organics	134.0	34.3	11.2	2.9	5.16%	6.41%
<b>ORGANIC TOTALS</b>	<b>780.0</b>	<b>104.3</b>	<b>65.0</b>	<b>8.7</b>	<b>30.04%</b>	<b>19.48%</b>
Fines	67.0	8.4	5.6	0.7	2.58%	1.57%
Other Inorganics	32.0	3.2	2.7	0.3	1.23%	0.60%
<b>INORGANIC TOTALS</b>	<b>99.0</b>	<b>11.6</b>	<b>8.3</b>	<b>1.0</b>	<b>3.81%</b>	<b>2.17%</b>
<b>TOTAL SORT</b>	<b>2596.2</b>	<b>535.4</b>	<b>216.4</b>	<b>44.6</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 3-6



## **SORT SUMMARY**

### **Seasonal variations**

- Paper totals, especially mixed paper, were considerably higher during the first sort. This trend is not consistent with other sites. Cause unknown.
- Aluminum cans doubled from the first to the third sort. Probably a result of warmer weather.
- Organic totals increased as the growing season progressed (yard waste is banned from Missouri landfills but several bags were found during the second and third sorts).
- Food waste increased in the second and third sorts. This was primarily due to watermelon rinds and corn shucks.

### **Sort results**

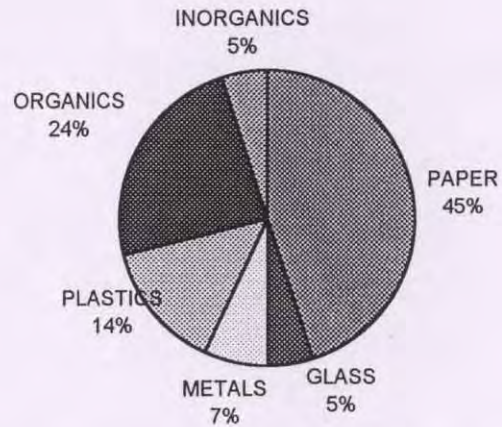
- Chart 3-1 graphically compares the three seasonal sort results and shows the average waste composition, by major category, for Springfield.
- The sample data for all Springfield waste sorts are listed on table 3-7.
- The sort results for all Springfield sorts are listed on table 3-8.
- The summary of statistical relevance for the Springfield sorts is located on page 36.
- The total for all “other wastes” found during the Springfield waste sorts is on page 36.

**All weights are in pounds and volumes are listed in cubic feet.**

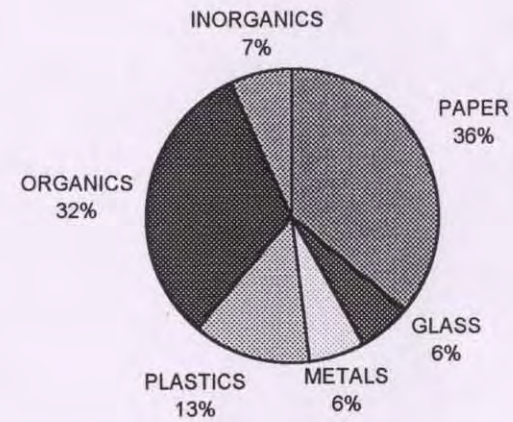
Comparisons of the Springfield waste stream to previous studies and other communities can be found in Chapter 13.

## SPRINGFIELD RESULTS BY WEIGHT

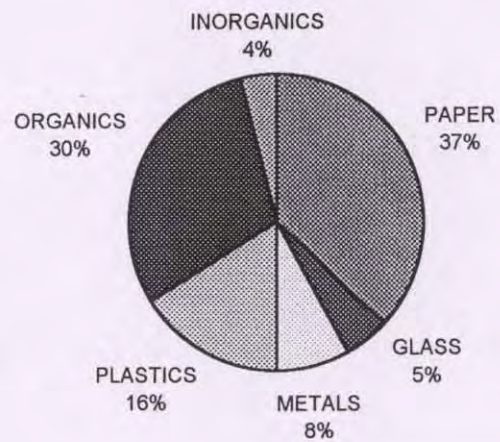
**SORT #1**



**SORT #2**



**SORT #3**



**SORT AVERAGE**

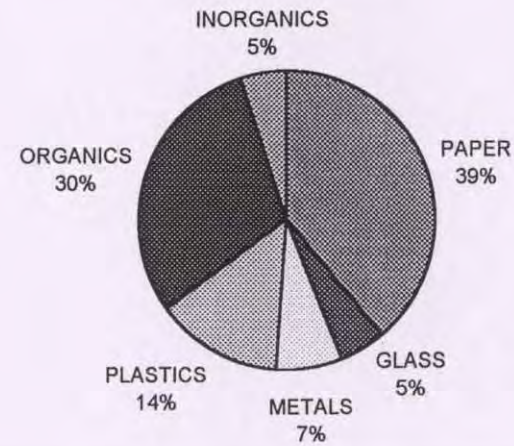


CHART 3-1



# **SPRINGFIELD SAMPLE SUMMARY**

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	2/7-2/9	14	2654.0	701.7	93%	7%
2	5/13-5/15	6	1825.0	310.0	100%	0%
3	9/3-9/5	12	2599.2	535.4	76%	24%
<b>TOTALS</b>		<b>32.0</b>	<b>7078.2</b>	<b>1547.1</b>		
<b>AVERAGE</b>		<b>10.7</b>	<b>2359.4</b>	<b>515.7</b>	<b>90%</b>	<b>10%</b>

TABLE 3-7



CATEGORY	SPRINGFIELD						SUMMARY	
	SORT # 1		SORT # 2		SORT #3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	8.8%	16.8%	6.3%	12.4%	6.7%	12.6%	7.4%	14.6%
Newsprint	8.8%	5.0%	11.5%	6.5%	8.8%	5.9%	9.5%	5.6%
Magazines	2.6%	1.6%	2.4%	1.5%	2.7%	1.7%	2.6%	1.6%
High Grade	1.0%	1.2%	0.9%	1.0%	3.3%	2.3%	1.8%	1.6%
Mixed	23.9%	23.3%	14.3%	13.8%	15.4%	18.0%	18.3%	19.7%
PAPER TOTALS	45.1%	47.9%	35.4%	35.2%	37.0%	40.4%	39.6%	43.0%
Clear	4.2%	2.0%	2.6%	1.2%	2.4%	1.0%	3.1%	1.5%
Brown	0.6%	0.3%	2.5%	1.9%	1.4%	0.5%	1.4%	0.7%
Green	0.1%	0.1%	0.5%	0.3%	0.6%	0.3%	0.4%	0.2%
Other	0.1%	0.1%	0.8%	0.3%	0.4%	0.2%	0.4%	0.1%
GLASS TOTALS	5.0%	2.4%	6.4%	3.7%	4.7%	2.0%	5.3%	2.6%
Alum. Cans	0.9%	1.3%	1.2%	3.2%	1.9%	3.1%	1.4%	2.3%
Other Alum	0.5%	0.6%	0.7%	1.1%	0.9%	0.5%	0.7%	0.7%
Non ferrous	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	0.1%	0.1%
Food Cans	4.8%	3.5%	3.0%	3.3%	4.0%	332.0%	4.0%	3.4%
Ferrous	0.6%	0.4%	1.0%	0.9%	1.6%	0.8%	1.1%	0.6%
Oil Filters	0.0%	0.0%	0.3%	0.1%	0.0%	0.0%	0.1%	0.0%
METAL TOTALS	6.8%	5.8%	6.2%	8.6%	8.5%	7.8%	7.3%	7.1%
PET # 1	2.1%	5.6%	1.9%	5.7%	2.6%	5.3%	2.2%	5.6%
HDPE # 2	2.0%	5.2%	2.0%	6.8%	2.8%	5.8%	2.3%	5.7%
Film	5.2%	9.5%	3.4%	6.8%	3.3%	7.8%	4.1%	8.4%
Other Plastic	4.6%	10.5%	5.9%	12.3%	7.2%	9.2%	5.9%	10.4%
PLASTIC TOTALS	13.9%	30.8%	13.2%	31.6%	16.0%	28.1%	14.5%	30.2%
Food Waste	14.3%	3.4%	18.4%	7.4%	18.3%	9.1%	16.8%	6.2%
Wood Waste	1.2%	0.6%	1.2%	0.7%	0.8%	0.5%	1.0%	0.6%
Textiles	4.0%	4.5%	3.8%	3.4%	3.2%	2.2%	3.7%	2.9%
Diapers	3.8%	1.9%	5.5%	3.5%	2.6%	1.3%	3.8%	2.1%
Other Organics	1.0%	1.0%	2.9%	2.3%	5.2%	6.4%	3.0%	3.1%
ORGANIC TOTALS	24.3%	11.4%	31.8%	17.3%	30.0%	19.5%	28.3%	14.9%
Fines	4.0%	1.3%	5.3%	2.9%	2.6%	1.6%	3.8%	1.7%
Other Inorganics	0.9%	0.4%	1.7%	0.7%	1.2%	0.6%	1.3%	0.5%
INORGANIC TOTALS	4.9%	1.7%	7.0%	3.6%	3.8%	2.2%	5.1%	2.2%
SORT TOTALS	100%	100%	100%	100%	100%	100%	100%	100%

TABLE 3-8



<b>Springfield Statistical Summary</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	188,000
<b>Total Sample Weight (lbs)</b>	7,077.7
<b>Total Number of Samples Collected</b>	32
<b>Significance Test Results</b>	.000
<b>Mean Sample (lbs) and Confidence Interval (95%)</b>	221.15 (+/-) 20.24

<b>Springfield "Other Waste" Summary</b>			
<b>Over-the-Counter Medication (OTC)</b>	7	<b>Beauty/Hygiene Aerosol Products</b>	9
<b>Prescription Medication (Rx)</b>	6	<b>Household Cleaning Aerosol Products</b>	4
<b>Beauty/Hygiene Products</b>	16	<b>Gardening/Yard Care Products</b>	7
<b>Household Cleaning Products</b>	11	<b>Pet Groom Products</b>	1
<b>Sharps/Blades</b>	2	<b>Disposable Razors</b>	5
<b>Syringes</b>	31	<b>Alkaline Batteries</b>	30
<b>Hardware/Shop Products</b>	15	<b>Automobile Maintenance/Cleaning Products</b>	3
<b>Aerosol Cans</b>	1		
<b>Miscellaneous items:</b> 1 quart of latex paint, 1 18" florescent tube, vinyl sheet with insecticide in it, full bingo marker, 1 thermometer.			



## Chapter 4: Reeds Spring

### COMMUNITY PROFILE

Reeds Spring is a rural community in the hilly Ozark region of Southwest Missouri and is a member of the Southwest Missouri Solid Waste Management District (District N). It is located in Stone county and accepts waste from both Stone and Taney Counties at the Reeds Spring Transfer Station.

The largest generator of solid waste is the City of Branson. Although Branson has a relatively small population, it is a booming tourist location. On an average Summer day over 50,000 tourist visit Branson, with many spending the night in local motels. The surrounding communities are small and provide much of the work force for the Branson tourist industry. This heavy seasonal tourist flow makes the Reeds Spring waste stream rather unique.

Reeds Spring is located on highway 13. It is 43 miles south of Springfield, 211 miles southeast of Kansas City, and 251 miles southwest of St. Louis.

#### Demographics:

	Stone County	Taney County
Area (sq. miles)	463	632
Population (1992)	20,864	27,592
Density (per sq. mile)	45	44
Pop. Change since 1980	33.9%	34.8%
Number of households	6,035	7,570
Persons per household	2.40	2.36
High school graduates	70.6%	70.8%
Median Family Income	\$23,772	\$24,229
Percent below poverty level	14.7%	13.6%



### **Solid waste collection**

American Disposal operates a fleet of packer trucks and collects most of the solid waste in Stone and Taney counties. All samples were taken from American Disposal trucks.

### **Solid waste disposal**

American Disposal owns and operates the Transfer station at Reeds Springs. Waste is consolidated and shipped to a landfill in Kansas. They receive approximately 66,000 tons of waste per year. The current tipping fee at the transfer station is \$44.00.

### **Waste reduction and recycling programs**

American Disposal offers some curbside service to residents in Hollister and collects recyclable materials from several commercial accounts. The City of Branson operates a drop-off center for recyclables. American Disposal also operates a material recovery facility (MRF) at the Reeds Spring location. In 1995 approximately 2,312 tons of material was recycled at the Reeds Spring location.

### **Reeds Spring Results**

Information about sample size and composition are listed in tables 4-1 through 4-8

**All weights are listed in pounds and all volumes are in cubic feet.**



## SORT # 1

### Sort Conditions

The first sort was conducted February 12th through the 15th. American Disposal provided a sort area inside a metal building next to the tipping and loading area. The tent used for the sorting facility was not required during this sort. The weather was mild and sunny; unseasonably warm for the time of year.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	454,000
Total Sample Weight (lbs)	3,846.0
Significance Test Results	.000
Number of Samples	14

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	2	Beauty/Hygiene Aerosol Products	1
Prescription Medication (Rx)	5	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	1	Gardening/Yard Care Products	0
Household Cleaning Products	0	Pet Groom Products	0
Sharps/Blades	0	Disposable Razors	0
Syringes	20	Alkaline Batteries	24
Hardware/Shop Products	4	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	1		
Miscellaneous items: 20 lbs. Of paint, part of a broken fluorescent tube, 1 shotgun shell.			



# **REEDS SPRING SORT #1**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	302.0	68.2	100%	0%	None	Crane, Stone Co
2	426.0	80.8	75%	25%	None	Rural So. Stone Co.
3	484.0	77.9	5%	95%	Drop-off	Branson, Stone Co.
4	474.0	68.8	90%	10%	None	Blue Eye, Stone Co.
5	201.0	47.7	75%	25%	Curb side	Hollister, Taney Co.
6	163.0	40.0	0%	100%	Drop-off	Branson, Taney Co.
7	232.0	42.0	80%	20%	None	Forsythe, Taney Co.
8	304.0	72.0	95%	5%	None	Reeds Spring, Spokane, Stone
9	155.0	41.0	75%	25%	None	Cape Fair, Galena, Stone Co.
10	269.0	40.8	90%	10%	Curb side	Hollister, Taney Co.
11	124.0	42.6	1%	99%	Drop-off	Branson, Stone Co.
12	152.0	49.3	100%	0%	Drop-off	Point Royale Condo's
13	251.0	67.1	100%	0%	None	Kinberling City, Stone Co.
14	309.0	57.6	60%	40%	None	Forsythe, Taney Co.
<b>TOTALS</b>	<b>3846.0</b>	<b>795.8</b>				
<b>AVERAGE</b>	<b>274.7</b>	<b>56.8</b>	<b>68%</b>	<b>32%</b>		

TABLE 4-1



CATEGORY	REEDS SPRING				SORT #1	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	332.6	137.0	23.8	9.8	8.62%	17.21%
Newsprint	263.1	43.0	18.8	3.1	6.82%	5.40%
Magazines	143.2	18.0	10.2	1.3	3.71%	2.26%
High Grade	77.8	18.6	5.6	1.3	2.02%	2.34%
Mixed	588.1	118.2	42.0	8.4	15.25%	14.85%
<b>PAPER TOTALS</b>	<b>1404.8</b>	<b>334.8</b>	<b>100.3</b>	<b>23.9</b>	<b>36.42%</b>	<b>42.07%</b>
Clear	161.2	15.0	11.5	1.1	4.18%	1.88%
Brown	75.4	7.0	5.4	0.5	1.96%	0.88%
Green	22.5	2.4	1.6	0.2	0.58%	0.30%
Other	11.9	1.3	0.9	0.1	0.31%	0.16%
<b>GLASS TOTALS</b>	<b>271.0</b>	<b>25.6</b>	<b>19.4</b>	<b>1.8</b>	<b>7.03%</b>	<b>3.22%</b>
Alum. Cans	44.4	15.7	3.2	1.1	1.15%	1.97%
Other Alum	20.0	7.3	1.4	0.5	0.52%	0.92%
Non ferrous	7.7	1.3	0.6	0.1	0.20%	0.16%
Food Cans	134.1	24.0	9.6	1.7	3.48%	3.01%
Ferrous	73.4	7.9	5.2	0.6	1.90%	0.99%
Oil Filters	17.5	1.0	1.3	0.1	0.45%	0.13%
<b>METAL TOTALS</b>	<b>297.1</b>	<b>57.1</b>	<b>21.2</b>	<b>4.1</b>	<b>7.70%</b>	<b>7.18%</b>
PET # 1	63.2	32.5	4.5	2.3	1.64%	4.09%
HDPE # 2	70.7	37.0	5.1	2.6	1.83%	4.65%
Film	153.9	86.0	11.0	6.1	3.99%	10.81%
Other Plastic	255.3	97.0	18.2	6.9	6.62%	12.19%
<b>PLASTIC TOTALS</b>	<b>543.1</b>	<b>252.5</b>	<b>38.8</b>	<b>18.0</b>	<b>14.08%</b>	<b>31.73%</b>
Food Waste	601.7	36.0	43.0	2.6	15.60%	4.52%
Wood Waste	58.6	8.5	4.2	0.6	1.52%	1.07%
Textiles	149.0	34.5	10.6	2.5	3.86%	4.34%
Diapers	105.7	13.3	7.6	0.9	2.74%	1.66%
Other Organics	68.0	10.3	4.9	0.7	1.76%	1.30%
<b>ORGANIC TOTALS</b>	<b>983.0</b>	<b>102.6</b>	<b>70.2</b>	<b>7.3</b>	<b>25.49%</b>	<b>12.89%</b>
Fines	281.4	16.5	20.1	1.2	7.30%	2.07%
Other Inorganics	76.3	6.8	5.5	0.5	1.98%	0.85%
<b>INORGANIC TOTALS</b>	<b>357.7</b>	<b>23.3</b>	<b>25.6</b>	<b>1.7</b>	<b>9.28%</b>	<b>2.92%</b>
<b>TOTAL SORT</b>	<b>3856.6</b>	<b>795.8</b>	<b>275.5</b>	<b>56.8</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 4-2







## **SORT # 2**

### **Sort Conditions**

The second sort was conducted May 20th through the 22nd. The sorting procedure used for the first round of sorts was also used for this sort. The sort facility was set approximately 500 yards south of the transfer building. The weather was overcast and seasonably mild.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	454,000
<b>Total Sample Weight (lbs)</b>	2,863.1
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	14

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	4	<b>Beauty/Hygiene Aerosol Products</b>	6
<b>Prescription Medication (Rx)</b>	5	<b>Household Cleaning Aerosol Products</b>	5
<b>Beauty/Hygiene Products</b>	5	<b>Gardening/Yard Care Products</b>	2
<b>Household Cleaning Products</b>	2	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	19
<b>Syringes</b>	5	<b>Alkaline Batteries</b>	9
<b>Hardware/Shop Products</b>	0	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	3		
<b>Miscellaneous items:</b> 1 butane lighter, 1 container of isopropyl alcohol, 1 can of "Silly String"			



# **REEDS SPRING** **SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	217	48.5	0%	100%	Drop-off	Branson
2	235	47.5	0%	100%	Drop-off	Branson
3	210	46.1	90%	10%	None	Branson West
4	192	50.3	0%	100%	Drop-off	Branson
5	207	49.1	0%	100%	None	Kimberling City
6	208.5	40.8	0%	100%	Drop-off	Branson/College of the Ozarks
7	184	40.3	0%	100%	None	Forsythe
8	185	38.1	100%	0%	Drop-off	Branson
9	249	48.9	0%	100%	Drop-off	Branson
10	200	40.5	90%	10%	None	Cape Fair/ Galena
11	194	46.4	0%	100%	Drop-off	Branson
12	231.5	47.2	0%	100%	Drop-off	Branson/Point Royale
13	176.6	39.3	40%	60%	Drop-off	Branson
14	173.5	40.5	0%	100%	Drop-off	Branson
<b>TOTALS</b>	<b>2863.1</b>	<b>623.5</b>				
<b>AVERAGE</b>	<b>204.5</b>	<b>44.5</b>	<b>23%</b>	<b>77%</b>		

TABLE 4-3

CATEGORY	REED SPRINGS				SORT # 2	
	TOTALS		AVERAGE		PERCENTAGES	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	153.0	55.2	10.9	3.9	5.35%	8.86%
Newsprint	236.0	44.2	16.9	3.2	8.24%	7.08%
Magazines	89.0	10.7	6.4	0.8	3.11%	1.72%
High Grade	149.0	30.3	10.6	2.2	5.21%	4.86%
Mixed	669.5	130.8	47.8	9.3	23.39%	20.98%
<b>PAPER TOTALS</b>	<b>1296.5</b>	<b>271.1</b>	<b>92.6</b>	<b>19.4</b>	<b>45.29%</b>	<b>43.49%</b>
Clear	100.8	10.0	7.2	0.7	3.52%	1.60%
Brown	55.5	5.2	4.0	0.4	1.94%	0.83%
Green	16.5	1.4	1.2	0.1	0.58%	0.22%
Other	21.5	2.0	1.5	0.1	0.75%	0.32%
<b>GLASS TOTALS</b>	<b>194.3</b>	<b>18.6</b>	<b>13.9</b>	<b>1.3</b>	<b>6.79%</b>	<b>2.98%</b>
Alum. Cans	56.5	23.0	4.0	1.6	1.97%	3.69%
Other Alum	24.6	7.7	1.8	0.6	0.86%	1.24%
Non ferrous	7.5	0.6	0.5	0.0	0.26%	0.10%
Food Cans	52.0	9.7	3.7	0.7	1.82%	1.56%
Ferrous	25.0	3.7	1.8	0.3	0.87%	0.59%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>165.6</b>	<b>44.7</b>	<b>11.8</b>	<b>3.2</b>	<b>5.79%</b>	<b>7.17%</b>
PET # 1	51.5	23.3	3.7	1.7	1.80%	3.74%
HDPE # 2	48.5	23.9	3.5	1.7	1.69%	3.83%
Film	149.5	57.0	10.7	4.1	5.22%	9.14%
Other Plastic	299.0	102.0	21.4	7.3	10.45%	16.36%
<b>PLASTIC TOTALS</b>	<b>548.5</b>	<b>206.2</b>	<b>39.2</b>	<b>14.7</b>	<b>19.16%</b>	<b>33.07%</b>
Food Waste	301.5	29.6	21.5	2.1	10.53%	4.75%
Wood Waste	11.0	1.0	0.8	0.1	0.38%	0.16%
Textiles	87.0	14.6	6.2	1.0	3.04%	2.33%
Diapers	56.5	7.4	4.0	0.5	1.97%	1.19%
Other Organics	60.0	11.3	4.3	0.8	2.10%	1.81%
<b>ORGANIC TOTALS</b>	<b>516.0</b>	<b>63.9</b>	<b>36.9</b>	<b>4.6</b>	<b>18.03%</b>	<b>10.24%</b>
Fines	110.0	14.2	7.9	1.0	3.84%	2.28%
Other Inorganics	31.5	4.7	2.3	0.3	1.10%	0.75%
<b>INORGANIC TOTALS</b>	<b>141.5</b>	<b>18.9</b>	<b>10.1</b>	<b>1.4</b>	<b>4.94%</b>	<b>3.03%</b>
<b>TOTAL SORT</b>	<b>2862.4</b>	<b>623.3</b>	<b>204.5</b>	<b>44.5</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 4-4







### **SORT # 3**

#### **Sort Conditions**

The third sort was conducted September 9th through the 11th. The sort facility was set up in the same area as Sort #2. Weather conditions were clear and warm.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	454,000
<b>Total Sample Weight (lbs)</b>	2,573.2
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	1	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	0	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	4	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	2	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	1
<b>Syringes</b>	1	<b>Alkaline Batteries</b>	7
<b>Hardware/Shop Products</b>	2	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> Flea killer for upholstery, caps for a play gun.			



# REEDS SPRING

## SORT # 3

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	218	51.5	10%	90%	None	Kimberling City-south
2	232	50.3	0%	100%	None	Branson West
3	246	56.9	50%	50%	None	Crane
4	281	79.6	100%	0%	Drop-off	Branson/ Point Royale
5	193	55.2	80%	20%	None	Hwy 86/ Taney Co.
6	246.5	55.4	0%	100%	None	Hwy 13/ Stone Co.
7	196	52.8	0%	100%	Drop-off	Branson
8	220	57.9	0%	100%	None	Kimberling City
9	150	26.8	60%	40%	None	Reeds Spring
10	174	30.7	0%	100%	Curbside	Hollister
11	202	46.5	60%	40%	Drop-off	Table Rock
12	214.7	48.8	95%	5%	Drop-off	Branson
<b>TOTALS</b>	<b>2573.2</b>	<b>612.4</b>				
<b>AVERAGE</b>	<b>214.4</b>	<b>51.0</b>	<b>38%</b>	<b>62%</b>		

TABLE 4-5

**REEDS SPRING****SORT # 3**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	225.7	84.2	18.8	7.0	8.78%	13.75%
Newsprint	175.0	33.2	14.6	2.8	6.81%	5.42%
Magazines	91.0	8.2	7.6	0.7	3.54%	1.34%
High Grade	104.0	16.7	8.7	1.4	4.05%	2.73%
Mixed	461.5	113.2	38.5	9.4	17.96%	18.48%
<b>PAPER TOTALS</b>	<b>1057.2</b>	<b>255.5</b>	<b>88.1</b>	<b>21.3</b>	<b>41.13%</b>	<b>41.72%</b>
Clear	103.5	12.0	8.6	1.0	4.03%	1.96%
Brown	60.5	6.0	5.0	0.5	2.35%	0.98%
Green	9.0	1.4	0.8	0.1	0.35%	0.23%
Other	15.0	0.8	1.3	0.1	0.58%	0.13%
<b>GLASS TOTALS</b>	<b>188.0</b>	<b>20.2</b>	<b>15.7</b>	<b>1.7</b>	<b>7.31%</b>	<b>3.30%</b>
Alum. Cans	69.5	27.6	5.8	2.3	2.70%	4.51%
Other Alum	22.0	2.5	1.8	0.2	0.86%	0.41%
Non ferrous	0.0	0.0	0.0	0.0	0.00%	0.00%
Food Cans	83.5	12.5	7.0	1.0	3.25%	2.04%
Ferrous	40.5	2.4	3.4	0.2	1.58%	0.39%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>215.5</b>	<b>45.0</b>	<b>18.0</b>	<b>3.8</b>	<b>8.38%</b>	<b>7.35%</b>
PET # 1	79.0	35.3	6.6	2.9	3.07%	5.76%
HDPE # 2	94.5	42.9	7.9	3.6	3.68%	7.01%
Film	115.0	57.7	9.6	4.8	4.47%	9.42%
Other Plastic	225.5	86.2	18.8	7.2	8.77%	14.08%
<b>PLASTIC TOTALS</b>	<b>514.0</b>	<b>222.1</b>	<b>42.8</b>	<b>18.5</b>	<b>20.00%</b>	<b>36.27%</b>
Food Waste	289.0	27.8	24.1	2.3	11.24%	4.54%
Wood Waste	13.0	2.8	1.1	0.2	0.51%	0.46%
Textiles	86.5	15.2	7.2	1.3	3.37%	2.48%
Diapers	47.5	5.5	4.0	0.5	1.85%	0.90%
Other Organics	63.0	8.2	5.3	0.7	2.45%	1.34%
<b>ORGANIC TOTALS</b>	<b>499.0</b>	<b>59.5</b>	<b>41.6</b>	<b>5.0</b>	<b>19.41%</b>	<b>9.72%</b>
Fines	72.0	8.8	6.0	0.7	2.80%	1.44%
Other Inorganics	24.5	1.3	2.0	0.1	0.95%	0.21%
<b>INORGANIC TOTALS</b>	<b>96.5</b>	<b>10.1</b>	<b>8.0</b>	<b>0.8</b>	<b>3.75%</b>	<b>1.65%</b>
<b>TOTAL SORT</b>	<b>2570.2</b>	<b>612.4</b>	<b>214.2</b>	<b>51.0</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 4-6



## **SORT SUMMARY**

### **Seasonal variations**

- The first sort was mostly residential because the tourist season had not begun. The second and third sorts were mostly commercial and represent the impact of the tourism industry on Branson.
- Paper totals were higher during the second and third round sorts. Most of this increase was promotional brochures for tourist attractions.
- Aluminum cans increased as the weather grew warmer.
- Plastic increased significantly after the first round. Much of this was polystyrene containers from fast food establishments.

### **Sort results**

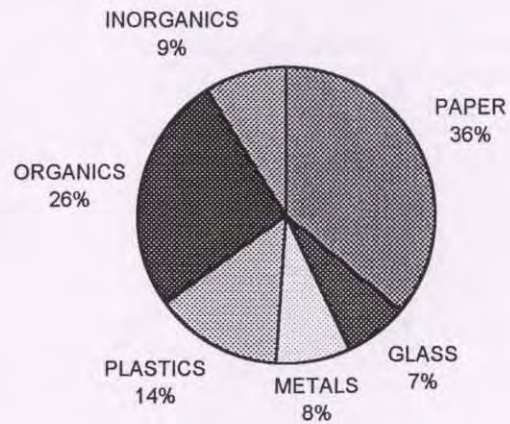
- Chart 4-1 graphically compares the three seasonal sort results and shows the average waste composition, by major category, for Reeds Spring.
- The sample data for all Reeds Spring waste sorts are listed on table 4-7.
- The sort results for Reeds Spring are listed on table 4-8.
- The summary of statistical relevance for the Reeds Spring sorts is located on page 54.
- The total for all “other wastes” found during the Reeds Spring sorts is on page 54.

**All weights are in pounds and volumes are listed in cubic feet.**

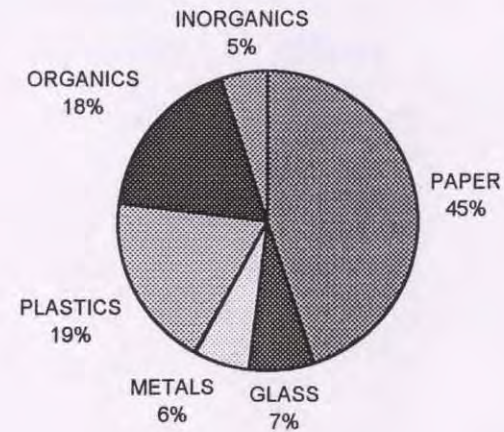
Comparisons of the Reed’s Spring waste stream to previous studies and other communities can be found in chapter 13.

## REED'S SPRING RESULTS BY WEIGHT

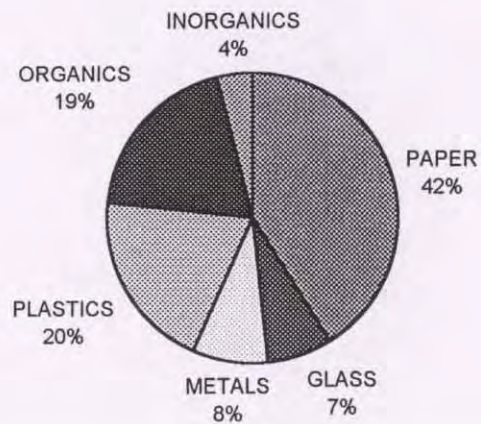
**SORT #1**



**SORT #2**



**SORT #3**



**SORT AVERAGE**

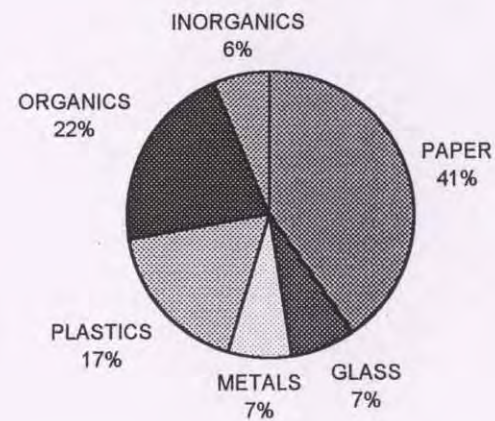


CHART 4-1



# **REEDS SPRING SAMPLE SUMMARY**

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	2/12-2/14	14	3846.0	795.8	68%	32%
2	5/20-5/22	14	2863.1	623.5	23%	77%
3	9/9-9/11	12	2573.2	612.4	38%	62%
<b>TOTALS</b>		<b>40.0</b>	<b>9282.3</b>	<b>2031.7</b>		
<b>AVERAGE</b>		<b>13.3</b>	<b>3094.1</b>	<b>677.2</b>	<b>43%</b>	<b>57%</b>

TABLE 4-7

CATEGORY	REEDS SPRING						SUMMARY	
	SORT # 1		SORT # 2		SORT #3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	8.6%	17.2%	5.4%	8.9%	8.8%	13.8%	7.7%	13.6%
Newsprint	6.8%	5.4%	8.2%	7.1%	6.8%	5.4%	7.2%	5.9%
Magazines	3.7%	2.3%	3.1%	1.7%	3.5%	1.3%	3.5%	1.8%
High Grade	2.0%	2.3%	5.2%	4.8%	4.0%	2.7%	3.6%	3.2%
Mixed	15.3%	14.9%	23.4%	21.0%	18.0%	18.5%	18.5%	17.8%
<b>PAPER TOTALS</b>	<b>36.4%</b>	<b>42.1%</b>	<b>45.3%</b>	<b>43.5%</b>	<b>41.1%</b>	<b>41.7%</b>	<b>40.4%</b>	<b>42.3%</b>
Clear	4.2%	1.9%	3.5%	1.6%	4.0%	2.0%	3.9%	1.8%
Brown	1.9%	0.9%	1.9%	0.8%	2.4%	1.0%	2.1%	0.9%
Green	0.6%	0.3%	0.6%	0.2%	0.3%	0.2%	0.5%	0.2%
Other	0.3%	0.1%	0.8%	0.3%	0.6%	0.1%	0.5%	0.2%
<b>GLASS TOTALS</b>	<b>7.0%</b>	<b>3.2%</b>	<b>6.8%</b>	<b>2.9%</b>	<b>7.3%</b>	<b>3.3%</b>	<b>7.1%</b>	<b>3.1%</b>
Alum. Cans	1.2%	2.0%	2.0%	3.7%	2.7%	4.5%	1.8%	3.3%
Other Alum	0.5%	0.9%	0.8%	1.2%	0.8%	0.4%	0.7%	0.9%
Non ferrous	0.2%	0.2%	0.3%	0.1%	0.0%	0.0%	0.2%	0.1%
Food Cans	3.5%	3.0%	1.8%	1.6%	3.3%	2.0%	2.9%	2.3%
Ferrous	1.9%	1.0%	0.9%	0.6%	1.6%	0.4%	1.5%	0.7%
Oil Filters	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%
<b>METAL TOTALS</b>	<b>7.7%</b>	<b>7.2%</b>	<b>5.8%</b>	<b>7.2%</b>	<b>8.4%</b>	<b>7.3%</b>	<b>7.3%</b>	<b>7.3%</b>
PET # 1	1.6%	4.1%	1.8%	3.7%	3.1%	5.8%	2.1%	4.5%
HDPE # 2	1.8%	4.6%	1.7%	3.8%	3.7%	7.0%	2.3%	5.1%
Film	4.0%	10.8%	5.2%	9.1%	4.4%	9.4%	4.5%	9.9%
Other Plastic	6.6%	12.2%	10.5%	16.4%	8.8%	14.1%	8.4%	14.0%
<b>PLASTIC TOTALS</b>	<b>14.0%</b>	<b>31.7%</b>	<b>19.2%</b>	<b>33.0%</b>	<b>20.0%</b>	<b>36.3%</b>	<b>17.3%</b>	<b>33.5%</b>
Food Waste	15.6%	4.5%	10.5%	4.8%	11.2%	4.5%	12.8%	4.6%
Wood Waste	1.5%	1.1%	0.4%	0.2%	0.5%	0.5%	0.9%	0.6%
Textiles	3.9%	4.3%	3.0%	2.3%	3.4%	2.5%	3.5%	3.2%
Diapers	2.7%	1.7%	2.0%	1.2%	1.8%	0.9%	2.3%	1.3%
Other Organics	1.8%	1.3%	2.1%	1.8%	2.5%	1.3%	2.1%	1.4%
<b>ORGANIC TOTALS</b>	<b>25.5%</b>	<b>12.9%</b>	<b>18.0%</b>	<b>10.3%</b>	<b>19.4%</b>	<b>9.7%</b>	<b>21.5%</b>	<b>11.2%</b>
Fines	7.3%	2.1%	3.8%	2.3%	2.8%	1.4%	5.0%	2.0%
Other Inorganics	2.0%	0.8%	1.1%	0.8%	1.0%	0.2%	1.4%	0.6%
<b>INORGANIC TOTALS</b>	<b>9.3%</b>	<b>2.9%</b>	<b>4.9%</b>	<b>3.1%</b>	<b>3.8%</b>	<b>1.6%</b>	<b>6.4%</b>	<b>2.6%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 4-8



Reeds Spring Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	454,000
Total Sample Weight (lbs)	9,282.3
Total Number of Samples Collected	40
Significance Test Results	.000
Mean Sample (lbs) and Confidence Interval (95%)	232.0(+/-)25.18

City of Reeds Spring "Other Waste" Summary			
Over-the-Counter Medication (OTC)	7	Beauty/Hygiene Aerosol Products	7
Prescription Medication (Rx)	10	Household Cleaning Aerosol Products	5
Beauty/Hygiene Products	10	Gardening/Yard Care Products	2
Household Cleaning Products	4	Pet Groom Products	0
Sharps/Blades	0	Disposable Razors	20
Syringes	26	Alkaline Batteries	40
Hardware/Shop Products	6	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	4		
Miscellaneous items: 20 lbs. of paint, part of a broken fluorescent tube, 1 butane lighter, 1 container of isopropyl alcohol, 1 can of "Silly String", flea killer for upholstery, caps for a play gun.			

## Chapter 5: Pemiscot County

### COMMUNITY PROFILE

The Pemiscot County Transfer Station is located in Southeast Missouri, in an area commonly referred to as the Bootheel. Most of the waste generated in the Bootheel region (Pemiscot and Dunklin Counties) is taken to the Pemiscot County Transfer Station, which is owned and operated by Pemiscot County. The transfer station is located 6 miles west of Hayti on county road Z. Both Pemiscot and Dunklin Counties are members of the Bootheel Solid Waste Management District. (District S).

The Bootheel Region of Missouri has long been identified as one of the most poverty stricken areas of Missouri. According to the 1990 census, Pemiscot County is the most poverty stricken county in the State of Missouri with 35.8% of the residents below the poverty level. Agribusiness is the primary industry.

Pemiscot County is 196 miles south of St. Louis, 257 miles southeast of Springfield, and 430 miles southeast of Kansas City.

#### Demographics:

	Pemiscot County	Dunklin County
Area (sq. miles)	493	546
Population (1992)	21,487	32,952
Density (per sq. mile)	44	60
Pop. Change since 1980	-14.0%	-9.3%
Number of households	8,210	13,128
Persons per household	2.62	2.48
High school graduates	49.5%	51.2%
Median Family Income	\$18,610	\$19,871
Percent below poverty level	35.8%	29.9%



### **Solid waste collection**

Most solid waste hauling is done by the individual municipalities. There is very little private waste hauling in the area.

### **Solid waste disposal**

The Pemiscot County Transfer Station is the only transfer facility in the two county area. Solid waste is shipped to the Allied Waste landfill in Dexter, MO. They receive approximately 15,000 tons of waste per year. The current tipping fee at the transfer station is \$32.50 per ton.

### **Waste reduction and recycling programs**

There are very few recycling opportunities in the area. No residential curbside recycling is available and drop-off sites are sparse. The sheltered workshops in Kennett and Caruthersville accept aluminum cans, some newsprint, and cardboard. The solid waste management district funded a recycling center in Steele in 1993, but the facility is currently only accepting cardboard and aluminum cans. The area has composting programs in Kennett, Caruthersville, and Steele. The poor economic condition of the area makes recycling a difficult challenge.

### **Pemiscot County Results**

Information about sample size and composition are listed in tables 5-1 through 5-8

**All weights are listed in pounds and all volumes are in cubic feet.**



## **SORT # 1**

### **Sort Conditions**

The first sort was conducted February 19th through the 21st. The sort facility was located on a gravel parking lot adjacent to the transfer building. The weather was colder and overcast due to heavy rain earlier that in the week.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	400,000
<b>Total Sample Weight (lbs)</b>	3,208
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	16

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	4	<b>Beauty/Hygiene Aerosol Products</b>	4
<b>Prescription Medication (Rx)</b>	7	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	4	<b>Gardening/Yard Care Products</b>	2
<b>Household Cleaning Products</b>	1	<b>Pet Groom Products</b>	1
<b>Sharps/Blades</b>	1	<b>Disposable Razors</b>	10
<b>Syringes</b>	23	<b>Alkaline Batteries</b>	26
<b>Hardware/Shop Products</b>	2	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	8		
<b>Miscellaneous items:</b> 1 bottle of relaxer chemicals for hair, 1 bullet			



**PEMISCOT COUNTY**  
**SORT #1**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	165	34.4	60%	40%	None	Portageville
2	188	49.2	100%	0%	None	Kennet
3	165	39.3	100%	0%	None	Homestown
4	186	52.8	100%	0%	None	Caruthersville
5	168	35.7	0%	100%	None	Caruthersville
6	203	51	100%	0%	None	Hayti
7	259	52	100%	0%	None	Steele
8	218	53	60%	40%	None	Hayti
9	201	41	85%	15%	None	Kennet
10	178	40.6	100%	0%	None	Cooter
11	184	41.9	100%	0%	None	Kennet
12	234	55.1	90%	10%	None	Kennet
13	208	46	0%	100%	None	Caruthersville
14	212	51.3	0%	100%	None	Steele
15	205	47.6	75%	25%	None	Hayti
16	234	40.9	100%	0%	None	Kennet
<b>TOTALS</b>	<b>3208</b>	<b>731.8</b>				
<b>AVERAGE</b>	<b>200.5</b>	<b>45.7375</b>	<b>73%</b>	<b>27%</b>		

TABLE 5-1

CATEGORY	PEMISCOT COUNTY				SORT #1	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	198.7	88.6	12.4	5.5	6.20%	12.09%
Newsprint	157.2	34.2	9.8	2.1	4.90%	4.66%
Magazines	122.1	18.8	7.6	1.2	3.81%	2.57%
High Grade	52.7	15.5	3.3	1.0	1.64%	2.12%
Mixed	680.5	133.5	42.5	8.3	21.22%	18.23%
<b>PAPER TOTALS</b>	<b>1211.2</b>	<b>290.5</b>	<b>75.7</b>	<b>18.2</b>	<b>37.77%</b>	<b>39.66%</b>
Clear	121.8	12.9	7.6	0.8	3.80%	1.76%
Brown	71.4	9.0	4.5	0.6	2.23%	1.23%
Green	8.8	2.6	0.6	0.2	0.27%	0.36%
Other	13.2	1.9	0.8	0.1	0.41%	0.25%
<b>GLASS TOTALS</b>	<b>215.2</b>	<b>26.4</b>	<b>13.4</b>	<b>1.7</b>	<b>6.71%</b>	<b>3.60%</b>
Alum. Cans	41.3	19.0	2.6	1.2	1.29%	2.59%
Other Alum	24.9	12.9	1.6	0.8	0.78%	1.76%
Non ferrous	6.2	1.5	0.4	0.1	0.19%	0.21%
Food Cans	123.7	26.8	7.7	1.7	3.86%	3.65%
Ferrous	21.6	4.2	1.4	0.3	0.67%	0.58%
Oil Filters	0.5	0.0	0.0	0.0	0.02%	0.00%
<b>METAL TOTALS</b>	<b>218.2</b>	<b>64.4</b>	<b>13.6</b>	<b>4.0</b>	<b>6.80%</b>	<b>8.79%</b>
PET # 1	37.5	26.8	2.3	1.7	1.17%	3.65%
HDPE # 2	61.9	41.8	3.9	2.6	1.93%	5.70%
Film	149.1	83.0	9.3	5.2	4.65%	11.33%
Other Plastic	163.6	81.2	10.2	5.1	5.10%	11.09%
<b>PLASTIC TOTALS</b>	<b>412.1</b>	<b>232.7</b>	<b>25.8</b>	<b>14.5</b>	<b>12.85%</b>	<b>31.77%</b>
Food Waste	534.3	38.0	33.4	2.4	16.66%	5.19%
Wood Waste	9.5	1.9	0.6	0.1	0.30%	0.26%
Textiles	165.8	28.0	10.4	1.8	5.17%	3.82%
Diapers	145.4	16.9	9.1	1.1	4.53%	2.30%
Other Organics	63.2	12.1	4.0	0.8	1.97%	1.65%
<b>ORGANIC TOTALS</b>	<b>918.2</b>	<b>96.9</b>	<b>57.4</b>	<b>6.1</b>	<b>28.63%</b>	<b>13.22%</b>
Fines	207.6	19.1	13.0	1.2	6.47%	2.61%
Other Inorganics	24.4	2.5	1.5	0.2	0.76%	0.35%
<b>INORGANIC TOTALS</b>	<b>232.0</b>	<b>21.6</b>	<b>14.5</b>	<b>1.4</b>	<b>7.23%</b>	<b>2.95%</b>
<b>TOTAL SORT</b>	<b>3206.9</b>	<b>732.5</b>	<b>200.4</b>	<b>45.8</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 5-2







## **SORT # 2**

### **Sort Conditions**

The second sort was conducted May 27th through the 29th. The sort facility was set up in the same location as the first sort. The sort procedure was changed from two to one table (see page 13). The weather was sunny and hot, with some humidity for the three days.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	400,000
<b>Total Sample Weight (lbs)</b>	2,498.5
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	7	<b>Beauty/Hygiene Aerosol Products</b>	3
<b>Prescription Medication (Rx)</b>	31 (bag)	<b>Household Cleaning Aerosol Products</b>	1
<b>Beauty/Hygiene Products</b>	11	<b>Gardening/Yard Care Products</b>	1
<b>Household Cleaning Products</b>	0	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	4	<b>Disposable Razors</b>	6
<b>Syringes</b>	14	<b>Alkaline Batteries</b>	43
<b>Hardware/Shop Products</b>	3	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> 1 bottle of lighter fluid.			



**PEMISCOT COUNTY**  
**SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	245	44.1	95%	5%	None	Kennet
2	214	46.1	100%	0%	None	Kennet-North
3	185	34.3	95%	5%	None	Kennet
4	167	44.2	0%	100%	None	Hayti
5	186.5	45.4	0%	100%	None	Hayti
6	192.5	43.3	95%	5%	None	Kennet
7	262	68.1	100%	0%	None	Caruthersville- Housing Project
8	203	41.6	90%	10%	None	Caruthersville
9	211	41	100%	0%	None	Kennet
10	190	42.2	100%	0%	None	Kennet
11	223	60.7	100%	0%	None	Caruthersville
12	219.5	54.7	95%	5%	None	Kennet
<b>TOTALS</b>	<b>2498.5</b>	<b>565.7</b>				
<b>AVERAGE</b>	<b>208.2</b>	<b>47.1</b>	<b>81%</b>	<b>19%</b>		

TABLE 5-3

<b>PEMISCOT COUNTY</b>					<b>SORT # 2</b>	
<b>CATEGORY</b>	<b>TOTALS</b>		<b>AVERAGE</b>		<b>PERCENTAGE</b>	
	<b>wt.</b>	<b>vol.</b>	<b>wt.</b>	<b>vol.</b>	<b>Pct. by wt.</b>	<b>Pct. by vol.</b>
Cardboard	170.5	61.6	14.2	5.1	6.83%	10.89%
Newsprint	162.5	22.8	13.5	1.9	6.51%	4.03%
Magazines	87.0	9.2	7.3	0.8	3.48%	1.63%
High Grade	56.0	11.1	4.7	0.9	2.24%	1.96%
Mixed	484.0	128.5	40.3	10.7	19.38%	22.73%
<b>PAPER TOTALS</b>	<b>960.0</b>	<b>233.2</b>	<b>80.0</b>	<b>19.4</b>	<b>38.45%</b>	<b>41.24%</b>
Clear	103.5	7.4	8.6	0.6	4.14%	1.31%
Brown	51.5	4.4	4.3	0.4	2.06%	0.78%
Green	20.0	1.8	1.7	0.2	0.80%	0.32%
Other	15.0	2.0	1.3	0.2	0.60%	0.35%
<b>GLASS TOTALS</b>	<b>190.0</b>	<b>15.6</b>	<b>15.8</b>	<b>1.3</b>	<b>7.61%</b>	<b>2.76%</b>
Alum. Cans	43.0	19.3	3.6	1.6	1.72%	3.40%
Other Alum	27.0	8.2	2.3	0.7	1.08%	1.44%
Non ferrous	4.0	0.4	0.3	0.0	0.16%	0.07%
Food Cans	70.0	16.4	5.8	1.4	2.80%	2.89%
Ferrous	22.5	2.8	1.9	0.2	0.90%	0.50%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>166.5</b>	<b>47.0</b>	<b>13.9</b>	<b>3.9</b>	<b>6.67%</b>	<b>8.30%</b>
PET # 1	39.5	20.5	3.3	1.7	1.58%	3.63%
HDPE # 2	48.0	26.8	4.0	2.2	1.92%	4.73%
Film	79.5	53.5	6.6	4.5	3.18%	9.46%
Other Plastic	183.5	87.4	15.3	7.3	7.35%	15.46%
<b>PLASTIC TOTALS</b>	<b>350.5</b>	<b>188.2</b>	<b>29.2</b>	<b>15.7</b>	<b>14.04%</b>	<b>33.28%</b>
Food Waste	534.0	41.3	44.5	3.4	21.39%	7.30%
Wood Waste	13.5	2.0	1.1	0.2	0.54%	0.35%
Textiles	58.0	10.4	4.8	0.9	2.32%	1.83%
Diapers	81.0	5.9	6.8	0.5	3.24%	1.04%
Other Organics	60.5	13.5	5.0	1.1	2.42%	2.39%
<b>ORGANIC TOTALS</b>	<b>747.0</b>	<b>73.0</b>	<b>62.3</b>	<b>6.1</b>	<b>29.92%</b>	<b>12.91%</b>
Fines	34.5	4.2	2.9	0.3	1.38%	0.73%
Other Inorganics	48.5	4.4	4.0	0.4	1.94%	0.78%
<b>INORGANIC TOTALS</b>	<b>83.0</b>	<b>8.6</b>	<b>6.9</b>	<b>0.7</b>	<b>3.32%</b>	<b>1.51%</b>
<b>TOTAL SORT</b>	<b>2497.0</b>	<b>565.4</b>	<b>208.1</b>	<b>47.1</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 5-4







### **SORT #3**

#### **Sort Conditions**

The third sort was conducted September 18th through the 20th. The sort facility was set up in a grassy area to the side of the loading building. Weather conditions were mild and cool.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	400,000
<b>Total Sample Weight (lbs)</b>	2,635.5
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	6	<b>Beauty/Hygiene Aerosol Products</b>	1
<b>Prescription Medication (Rx)</b>	3	<b>Household Cleaning Aerosol Products</b>	1
<b>Beauty/Hygiene Products</b>	9	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	5	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	1	<b>Disposable Razors</b>	23
<b>Syringes</b>	15 and one can	<b>Alkaline Batteries</b>	5
<b>Hardware/Shop Products</b>	1	<b>Automobile Maintenance/Cleaning Products</b>	1
<b>Aerosol Cans</b>	1		
<b>Miscellaneous items:</b> 1 container janitorial industrial strength cleaner, 1 container Toshiba copier toner, 1 lighter.			



**PEMISCOT COUNTY**  
**SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	205	45.6	100%	0%	Drop-off	Kennet
2	176	40.5	100%	0%	Drop-off	Kennet
3	201	37.2	100%	0%	Drop-off	Kennet
4	201.5	41	100%	0%	Drop-off	Kennet
5	290	58.5	0%	100%	None	Hayti
6	233	51.5	100%	0%	None	Steele
7	185	39.7	100%	0%	Drop-off	Kennet
8	207	37.3	100%	0%	None	Portageville
9	292	59.5	100%	0%	None	Portageville
10	260	51.7	100%	0%	Drop-off	Caruthersville
11	234	47.1	80%	20%	None	Hayti
12	151	24.3	100%	0%	Drop-off	Hayti
<b>TOTALS</b>	<b>2635.5</b>	<b>533.9</b>				
<b>AVERAGE</b>	<b>219.625</b>	<b>44.49167</b>	<b>90%</b>	<b>10%</b>		

TABLE 5-5

**PEMISCOT COUNTY****SORT # 3**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	167.5	62.6	14.0	5.2	6.36%	11.73%
Newsprint	146.0	21.7	12.2	1.8	5.54%	4.06%
Magazines	100.0	8.4	8.3	0.7	3.80%	1.57%
High Grade	130.5	17.9	10.9	1.5	4.95%	3.35%
Mixed	415.5	100.9	34.6	8.4	15.77%	18.90%
<b>PAPER TOTALS</b>	<b>959.5</b>	<b>211.5</b>	<b>80.0</b>	<b>17.6</b>	<b>36.43%</b>	<b>39.61%</b>
Clear	86.5	7.8	7.2	0.7	3.28%	1.46%
Brown	70.0	7.0	5.8	0.6	2.66%	1.31%
Green	5.0	0.4	0.4	0.0	0.19%	0.07%
Other	26.0	1.7	2.2	0.1	0.99%	0.32%
<b>GLASS TOTALS</b>	<b>187.5</b>	<b>16.9</b>	<b>15.6</b>	<b>1.4</b>	<b>7.12%</b>	<b>3.17%</b>
Alum. Cans	54.0	22.0	4.5	1.8	2.05%	4.12%
Other Alum	20.5	3.5	1.7	0.3	0.78%	0.66%
Non ferrous	3.0	0.4	0.3	0.0	0.11%	0.07%
Food Cans	81.0	14.1	6.8	1.2	3.08%	2.64%
Ferrous	23.1	2.3	1.9	0.2	0.88%	0.43%
Oil Filters	2.0	0.1	0.2	0.0	0.08%	0.02%
<b>METAL TOTALS</b>	<b>183.6</b>	<b>42.4</b>	<b>15.3</b>	<b>3.5</b>	<b>6.97%</b>	<b>7.94%</b>
PET # 1	55.5	24.9	4.6	2.1	2.11%	4.66%
HDPE # 2	77.0	39.5	6.4	3.3	2.92%	7.40%
Film	83.0	34.1	6.9	2.8	3.15%	6.39%
Other Plastic	189.5	70.7	15.8	5.9	7.19%	13.24%
<b>PLASTIC TOTALS</b>	<b>405.0</b>	<b>169.2</b>	<b>33.8</b>	<b>14.1</b>	<b>15.38%</b>	<b>31.69%</b>
Food Waste	582.5	54.2	48.5	4.5	22.11%	10.15%
Wood Waste	13.5	1.0	1.1	0.1	0.51%	0.19%
Textiles	61.5	9.6	5.1	0.8	2.33%	1.80%
Diapers	111.0	12.8	9.3	1.1	4.21%	2.40%
Other Organics	69.5	9.1	5.8	0.8	2.64%	1.70%
<b>ORGANIC TOTALS</b>	<b>838.0</b>	<b>86.7</b>	<b>69.8</b>	<b>7.2</b>	<b>31.81%</b>	<b>16.24%</b>
Fines	44.5	5.3	3.7	0.4	1.69%	0.99%
Other Inorganics	16.0	1.9	1.3	0.2	0.61%	0.36%
<b>INORGANIC TOTALS</b>	<b>60.5</b>	<b>7.2</b>	<b>5.0</b>	<b>0.6</b>	<b>2.30%</b>	<b>1.35%</b>
<b>TOTAL SORT</b>	<b>2634.1</b>	<b>533.9</b>	<b>219.5</b>	<b>44.5</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 5-6



## **SORT SUMMARY**

### **Seasonal variations**

- Aluminum cans and PET containers increased as the weather warmed.
- Fines were higher in the first round. Modification in the sorting procedure caused more of the fines to be sorted into the appropriate categories in the second and third round.
- Food waste increased during the second and third rounds due to watermelon rinds.

### **Sort results**

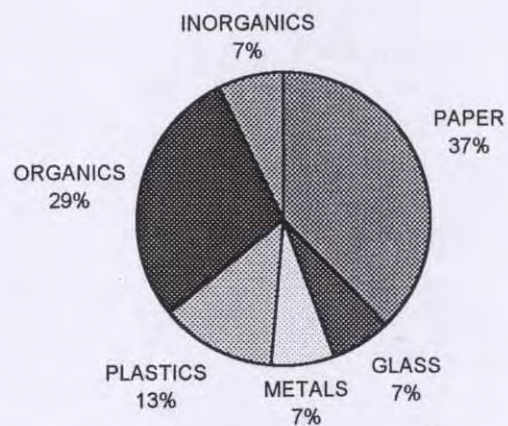
- Chart 5-1 graphically compares the three seasonal sort results and shows the average waste composition, by major category, for Pemiscot County.
- The sample data for all Pemiscot County waste sorts is listed on table 5-7.
- The sort results for all Pemiscot County waste sorts are listed on table 5-8.
- The summary of statistical relevance for the Pemiscot County sorts is located on page 72.
- The total for all “other wastes” found during the Pemiscot County waste sorts is on page 72.

**All weights are in pounds and volumes are listed in cubic feet.**

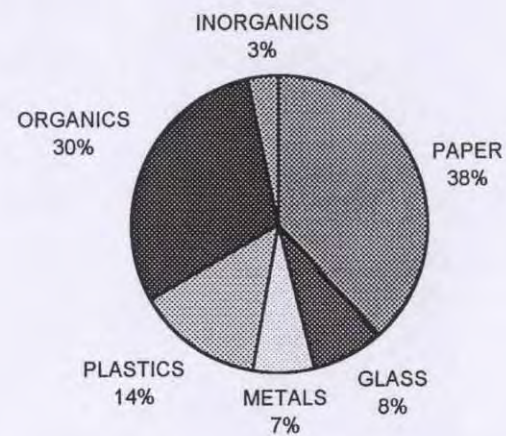
Comparisons of the Pemiscot County waste stream to previous studies and other communities can be found in chapter 13.

## PEMISCOT COUNTY RESULTS BY WEIGHT

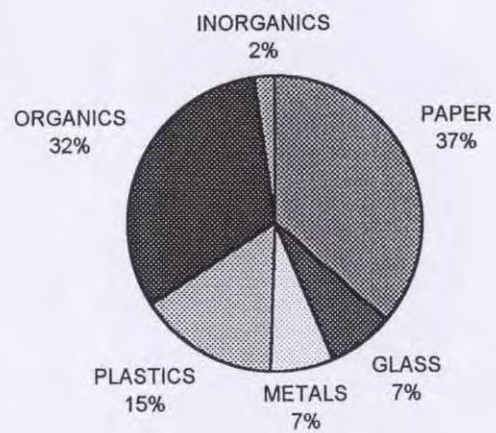
**SORT #1**



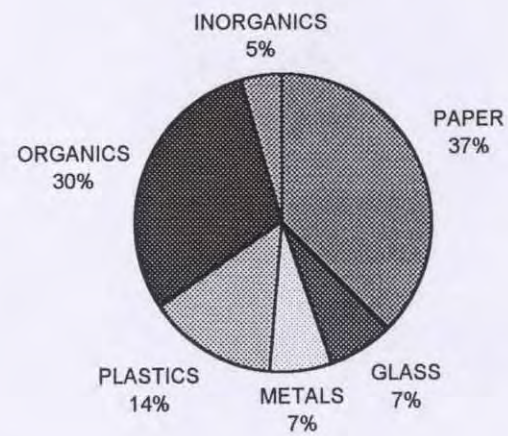
**SORT #2**



**SORT #3**



**SORT AVERAGE**





# **PEMISCOT COUNTY SAMPLE SUMMARY**

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	2/19-2/21	16	3208.0	731.8	73%	27%
2	5/28-5/30	12	2498.5	565.7	81%	19%
3	9/16-9/18	12	2635.5	533.9	90%	10%
<b>TOTALS</b>		<b>40.0</b>	<b>8342.0</b>	<b>1831.4</b>		
<b>AVERAGE</b>		<b>13.3</b>	<b>2780.7</b>	<b>610.5</b>	<b>81%</b>	<b>19%</b>

TABLE 5-7

<b>PEMISCOT COUNTY</b>							<b>SUMMARY</b>	
<b>CATEGORY</b>	<b>SORT # 1</b>		<b>SORT # 2</b>		<b>SORT #3</b>		<b>AVERAGE</b>	
	<b>WT.</b>	<b>VOL.</b>	<b>WT.</b>	<b>VOL.</b>	<b>WT.</b>	<b>VOL.</b>	<b>WT.</b>	<b>VOL.</b>
Cardboard	6.2%	12.1%	6.8%	10.9%	6.4%	11.8%	6.4%	11.7%
Newsprint	4.9%	4.6%	6.5%	4.1%	5.5%	4.1%	5.6%	4.3%
Magazines	3.8%	2.6%	3.5%	1.6%	3.8%	1.6%	3.7%	2.0%
High Grade	1.6%	2.2%	2.2%	1.9%	5.0%	3.4%	2.9%	2.4%
Mixed	21.2%	18.2%	19.4%	22.8%	15.8%	18.9%	19.0%	19.8%
<b>PAPER TOTALS</b>	<b>37.8%</b>	<b>39.7%</b>	<b>38.4%</b>	<b>41.3%</b>	<b>36.4%</b>	<b>39.7%</b>	<b>37.6%</b>	<b>40.2%</b>
Clear	3.8%	1.8%	4.1%	1.3%	3.3%	1.5%	3.7%	1.5%
Brown	2.2%	1.2%	2.1%	0.8%	2.7%	1.3%	2.3%	1.1%
Green	0.3%	0.4%	0.8%	0.3%	0.2%	0.1%	0.4%	0.3%
Other	0.4%	0.3%	0.6%	0.4%	1.0%	0.3%	0.6%	0.3%
<b>GLASS TOTALS</b>	<b>6.7%</b>	<b>3.6%</b>	<b>7.6%</b>	<b>2.8%</b>	<b>7.1%</b>	<b>3.2%</b>	<b>7.1%</b>	<b>3.2%</b>
Alum. Cans	1.3%	2.6%	1.7%	3.4%	2.0%	4.1%	1.7%	3.3%
Other Alum	0.8%	1.8%	1.1%	1.4%	0.8%	0.7%	0.9%	1.3%
Non ferrous	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.2%	0.1%
Food Cans	3.9%	3.7%	2.8%	2.8%	3.1%	2.6%	3.3%	3.1%
Ferrous	0.7%	0.6%	0.9%	0.5%	0.9%	0.4%	0.8%	0.5%
Oil Filters	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
<b>METAL TOTALS</b>	<b>6.8%</b>	<b>8.8%</b>	<b>6.7%</b>	<b>8.2%</b>	<b>7.0%</b>	<b>7.9%</b>	<b>6.8%</b>	<b>8.4%</b>
PET # 1	1.2%	3.7%	1.6%	3.7%	2.1%	4.7%	1.6%	4.0%
HDPE # 2	1.9%	5.7%	1.9%	4.8%	2.9%	7.5%	2.2%	5.9%
Film	4.6%	11.3%	3.2%	9.5%	3.1%	6.3%	3.7%	9.3%
Other Plastic	5.1%	11.0%	7.3%	15.4%	7.2%	13.3%	6.4%	13.0%
<b>PLASTIC TOTALS</b>	<b>12.9%</b>	<b>31.7%</b>	<b>14.0%</b>	<b>33.4%</b>	<b>15.4%</b>	<b>31.7%</b>	<b>14.0%</b>	<b>32.2%</b>
Food Waste	16.6%	5.2%	21.4%	7.2%	22.1%	10.1%	19.8%	7.2%
Wood Waste	0.3%	0.3%	0.5%	0.4%	0.5%	0.2%	0.4%	0.3%
Textiles	5.2%	3.8%	2.3%	1.8%	2.3%	1.8%	3.4%	2.6%
Diapers	4.5%	2.3%	3.2%	1.0%	4.2%	2.4%	4.0%	2.0%
Other Organics	2.0%	1.6%	2.4%	2.5%	2.7%	1.7%	2.3%	1.9%
<b>ORGANIC TOTALS</b>	<b>28.6%</b>	<b>13.2%</b>	<b>29.9%</b>	<b>12.9%</b>	<b>31.8%</b>	<b>16.2%</b>	<b>30.0%</b>	<b>14.0%</b>
Fines	6.5%	2.6%	1.4%	0.7%	1.7%	1.0%	3.4%	1.6%
Other Inorganics	0.8%	0.3%	1.9%	0.8%	0.6%	0.4%	1.1%	0.5%
<b>INORGANIC TOTALS</b>	<b>7.2%</b>	<b>2.9%</b>	<b>3.3%</b>	<b>1.5%</b>	<b>2.3%</b>	<b>1.3%</b>	<b>4.5%</b>	<b>2.0%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 5-8



<b>Pemiscot County Statistical Summary</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	400,000
<b>Total Sample Weight (lbs)</b>	8,342
<b>Total Number of Samples Collected</b>	40
<b>Significance Test Results</b>	.000
<b>Mean Sample (lbs) and Confidence Interval (95%)</b>	208.52 (+/-) 10.54

<b>Pemiscot County "Other Waste" Summary</b>			
<b>Over-the-Counter Medication (OTC)</b>	17	<b>Beauty/Hygiene Aerosol Products</b>	8
<b>Prescription Medication (Rx)</b>	41	<b>Household Cleaning Aerosol Products</b>	2
<b>Beauty/Hygiene Products</b>	24	<b>Gardening/Yard Care Products</b>	3
<b>Household Cleaning Products</b>	6	<b>Pet Groom Products</b>	1
<b>Sharps/Blades</b>	6	<b>Disposable Razors</b>	39
<b>Syringes</b>	20 + can	<b>Alkaline Batteries</b>	74
<b>Hardware/Shop Products</b>	6	<b>Automobile Maintenance/Cleaning Products</b>	1
<b>Aerosol Cans</b>	9		
<b>Miscellaneous items:</b> 1 bottle chemical relaxer, 1 bullet, 1 bottle of lighter fluid, 1 container industrial strength cleaner, 1 container copier toner, 1 lighter.			

## Chapter 6: St. Francois County

### COMMUNITY PROFILE

St. Francois County is located in East Central Missouri and is a member of the Southeast Missouri Solid Waste Management District (District R). The County is growing rapidly and has expanding industrial, service, and retail sectors. Many of the residents commute to jobs in the St. Louis area which is 65 miles to the north.

The St. Francois County Transfer Station is owned and operated by the St. Francois County Environmental Corporation. It is located between the cities of Park Hills and Desloge. Most of the solid waste generated within the county is taken to the St. Francois County Transfer Station.

The St. Francois County Transfer Station is 65 miles south of St. Louis, 190 miles northwest of Springfield, and 281 miles southeast of Kansas City.

#### Demographics:

	St. Francois County
Area (sq. miles)	450
Population (1992)	50,147
Density (per sq. mile)	112
Pop. Change since 1980	17.7%
Number of households	17,670
Persons per household	2.59
High school graduates	62.5%
Median Family Income	\$25,044
Percent below poverty level	16.9%



### **Solid waste collection**

Most solid waste hauling is done by the individual municipalities. The principal exception is the City of Farmington (the largest city in the county) which is served by private waste haulers. There are also private waste haulers that serve the outlying rural areas.

### **Solid waste disposal**

The St. Francois County Transfer Station is the only transfer facility in the county. Solid waste is shipped to the Butler County Landfill which is owned by Allied Waste. The transfer station receives approximately 20,000 tons of waste per year. The current tipping fee at the transfer station is \$42.00.

### **Waste reduction and recycling programs**

The City of Park Hills and the City of Desloge operate drop-off centers and both are contemplating curbside collection programs. The City of Bonne Terre began a curbside program after the waste sorts were conducted. There is also a drop-off site at the transfer station and the transfer station processes and markets materials for the other drop-off centers.

### **St. Francois County Results**

Information about sample size and composition are listed in tables 6-1 through 6-8

**All weights are listed in pounds and all volumes are in cubic feet.**

## **SORT # 1**

### **Sort Conditions**

The first sort was conducted February 26 through the 29th. The sort facility was set up on the north side of the transfer building. Weather conditions varied from sunny and unseasonably warm the first day, colder and raining the second day, to windy and very cold the third day.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	240,000
Total Sample Weight (lbs)	3,228
Significance Test Results	.000
Number of Samples	15

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	2	Beauty/Hygiene Aerosol Products	0
Prescription Medication (Rx)	4	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	6	Gardening/Yard Care Products	1
Household Cleaning Products	0	Pet Groom Products	0
Sharps/Blades	2	Disposable Razors	33
Syringes	55	Alkaline Batteries	30
Hardware/Shop Products	3	Automobile Maintenance/Cleaning Products	2
Aerosol Cans	0		
Miscellaneous items: 1 package of fish attractant, 1 bottle of hair color			



**ST. FRANCOIS COUNTY**  
**SORT #1**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	214	53.8	100%	0%	Drop-off	Park Hills
2	240	50.7	100%	0%	None	Rural Jefferson Co.
3	202	41.2	100%	0%	None	Rural Iron Co.
4	235	47.3	80%	20%	Drop-off	Desloge
5	253	50	75%	25%	Drop-off	Farmington
6	212	39	80%	20%	Drop-off	Bonne Terre
7	220	47	100%	0%	Drop-off	Park Hills
8	224	51	100%	0%	Drop-off	Desloge
9	272	49	80%	20%	Drop-off	Bonne Terre
10	168	39.2	50%	50%	Drop-off	Farmington
11	220	53	95%	5%	None	Ste. Genevieve
12	172	49.6	100%	0%	Drop-off	Park Hills
13	216	59.1	100%	0%	Curbside	Potosi
14	215	46.9	100%	0%	Drop-off	Park Hills
15	165	45	100%	0%	Drop-off	De Soto
<b>TOTALS</b>	<b>3228</b>	<b>721.8</b>				
<b>AVERAGE</b>	<b>215.2</b>	<b>48.12</b>	<b>91%</b>	<b>9%</b>		

TABLE 6-1

CATEGORY	ST FRANCOIS COUNTY				SORT #1	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	227.5	81.5	15.2	5.4	7.05%	11.31%
Newsprint	189.4	38.7	12.6	2.6	5.87%	5.37%
Magazines	112.6	14.4	7.5	1.0	3.49%	2.00%
High Grade	71.2	16.8	4.7	1.1	2.21%	2.33%
Mixed	611.8	130.8	40.8	8.7	18.96%	18.16%
<b>PAPER TOTALS</b>	<b>1212.5</b>	<b>282.2</b>	<b>80.8</b>	<b>18.8</b>	<b>37.58%</b>	<b>39.17%</b>
Clear	149.9	16.4	10.0	1.1	4.65%	2.28%
Brown	51.9	6.8	3.5	0.5	1.61%	0.94%
Green	9.0	1.6	0.6	0.1	0.28%	0.22%
Other	15.6	2.5	1.0	0.2	0.48%	0.35%
<b>GLASS TOTALS</b>	<b>226.4</b>	<b>27.3</b>	<b>15.1</b>	<b>1.8</b>	<b>7.02%</b>	<b>3.79%</b>
Alum. Cans	49.7	23.5	3.3	1.6	1.54%	3.26%
Other Alum	19.1	8.9	1.3	0.6	0.59%	1.24%
Non ferrous	7.6	1.6	0.5	0.1	0.24%	0.22%
Food Cans	144.9	29.3	9.7	2.0	4.49%	4.07%
Ferrous	24.2	4.2	1.6	0.3	0.75%	0.58%
Oil Filters	5.0	0.7	0.3	0.0	0.15%	0.10%
<b>METAL TOTALS</b>	<b>250.5</b>	<b>68.2</b>	<b>16.7</b>	<b>4.5</b>	<b>7.76%</b>	<b>9.47%</b>
PET # 1	55.6	35.9	3.7	2.4	1.72%	4.98%
HDPE # 2	75.7	44.6	5.0	3.0	2.35%	6.19%
Film	109.1	50.3	7.3	3.4	3.38%	6.98%
Other Plastic	182.7	80.5	12.2	5.4	5.66%	11.17%
<b>PLASTIC TOTALS</b>	<b>423.1</b>	<b>211.3</b>	<b>28.2</b>	<b>14.1</b>	<b>13.11%</b>	<b>29.33%</b>
Food Waste	455.3	36.3	30.4	2.4	14.11%	5.04%
Wood Waste	18.5	2.6	1.2	0.2	0.57%	0.35%
Textiles	147.5	34.2	9.8	2.3	4.57%	4.74%
Diapers	190.7	22.1	12.7	1.5	5.91%	3.07%
Other Organics	29.2	10.2	1.9	0.7	0.91%	1.42%
<b>ORGANIC TOTALS</b>	<b>841.2</b>	<b>105.3</b>	<b>56.1</b>	<b>7.0</b>	<b>26.07%</b>	<b>14.62%</b>
Fines	241.1	23.2	16.1	1.5	7.47%	3.22%
Other Inorganics	31.4	2.9	2.1	0.2	0.97%	0.40%
<b>INORGANIC TOTALS</b>	<b>272.5</b>	<b>26.1</b>	<b>18.2</b>	<b>1.7</b>	<b>8.45%</b>	<b>3.62%</b>
<b>TOTAL SORT</b>	<b>3226.2</b>	<b>720.5</b>	<b>215.1</b>	<b>48.0</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 6-2





## **SORT # 2**

### **Sort Conditions**

The second sort was conducted June 3rd through the 5th. The sort facility was set up in the same area as the first sort. Weather conditions were sunny and warm.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	240,000
<b>Total Sample Weight (lbs)</b>	2,714.4
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	0	<b>Beauty/Hygiene Aerosol Products</b>	4
<b>Prescription Medication (Rx)</b>	2	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	7	<b>Gardening/Yard Care Products</b>	1
<b>Household Cleaning Products</b>	1	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	3	<b>Disposable Razors</b>	13
<b>Syringes</b>	15	<b>Alkaline Batteries</b>	14
<b>Hardware/Shop Products</b>	2	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	1		
<b>Miscellaneous items:</b> 1 bottle of lighter fluid, 2 shotgun shells, 1 container of propane.			



**ST. FRANCOIS COUNTY**  
**SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	238	45.5	100%	0%	Drop-off	Park Hills
2	254	42.4	50%	50%	Drop-off	Bonne Terre
3	282	56.5	100%	0%	Drop-off	Potosi
4	266.4	50.4	0%	100%	Drop-off	Lake Sanitation/ Camp Waste
5	312	65.2	100%	0%	Drop-off	Washington Co./ Rural routes
6	212	50	50%	50%	Drop-off	Desloge/ City
7	269	61.9	100%	0%	Drop-off	Park Hills/ City
8	189	42.9	100%	0%	Drop-off	St. Genevieve/ Rural routes
9	212	46.3	95%	5%	Drop-off	Bonne Terre/ City
10	138	31.5	100%	0%	Drop-off	Desloge/ City
11	161	38.7	50%	50%	Drop-off	Farmington/ City
12	181	33.3	50%	50%	Drop-off	Farmington/ City
<b>TOTALS</b>	<b>2714.4</b>	<b>564.6</b>				
<b>AVERAGE</b>	<b>226.2</b>	<b>47.05</b>	<b>75%</b>	<b>25%</b>		

TABLE 6-3

CATEGORY	ST. FRANCOIS COUNTY				SORT # 2	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	176.5	67.0	14.7	5.6	6.50%	11.87%
Newsprint	180.5	28.0	15.0	2.3	6.65%	4.96%
Magazines	126.0	11.0	10.5	0.9	4.64%	1.95%
High Grade	105.0	17.6	8.8	1.5	3.87%	3.11%
Mixed	361.0	95.0	30.1	7.9	13.30%	16.83%
<b>PAPER TOTALS</b>	<b>949.0</b>	<b>218.6</b>	<b>79.1</b>	<b>18.2</b>	<b>34.96%</b>	<b>38.71%</b>
Clear	86.0	7.1	7.2	0.6	3.17%	1.26%
Brown	50.0	4.0	4.2	0.3	1.84%	0.71%
Green	9.0	1.0	0.8	0.1	0.33%	0.18%
Other	10.0	0.8	0.8	0.1	0.37%	0.14%
<b>GLASS TOTALS</b>	<b>155.0</b>	<b>12.9</b>	<b>12.9</b>	<b>1.1</b>	<b>5.71%</b>	<b>2.29%</b>
Alum. Cans	57.0	15.7	4.8	1.3	2.10%	2.78%
Other Alum	32.0	5.3	2.7	0.4	1.18%	0.94%
Non ferrous	4.5	0.3	0.4	0.0	0.17%	0.05%
Food Cans	97.5	15.6	8.1	1.3	3.59%	2.76%
Ferrous	37.5	5.1	3.1	0.4	1.38%	0.90%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>228.5</b>	<b>42.0</b>	<b>19.0</b>	<b>3.5</b>	<b>8.42%</b>	<b>7.44%</b>
PET # 1	55.5	22.2	4.6	1.9	2.04%	3.93%
HDPE # 2	66.0	30.1	5.5	2.5	2.43%	5.33%
Film	103.0	56.5	8.6	4.7	3.79%	10.01%
Other Plastic	177.0	71.1	14.8	5.9	6.52%	12.59%
<b>PLASTIC TOTALS</b>	<b>401.5</b>	<b>179.9</b>	<b>33.5</b>	<b>15.0</b>	<b>14.79%</b>	<b>31.87%</b>
Food Waste	518.0	49.0	43.2	4.1	19.08%	8.68%
Wood Waste	29.0	2.6	2.4	0.2	1.07%	0.46%
Textiles	147.0	20.7	12.3	1.7	5.42%	3.67%
Diapers	98.4	11.0	8.2	0.9	3.63%	1.95%
Other Organics	93.0	16.8	7.8	1.4	3.43%	2.98%
<b>ORGANIC TOTALS</b>	<b>885.4</b>	<b>100.1</b>	<b>73.8</b>	<b>8.3</b>	<b>32.62%</b>	<b>17.73%</b>
Fines	63.0	8.7	5.3	0.7	2.32%	1.54%
Other Inorganics	32.0	2.4	2.7	0.2	1.18%	0.43%
<b>INORGANIC TOTALS</b>	<b>95.0</b>	<b>11.1</b>	<b>7.9</b>	<b>0.9</b>	<b>3.50%</b>	<b>1.97%</b>
<b>TOTAL SORT</b>	<b>2714.4</b>	<b>564.6</b>	<b>226.2</b>	<b>47.0</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 6-4





### **SORT #3**

#### **Sort Conditions**

The third sort was conducted September 23rd through the 25th. The sort facility was set up on a gravel pad approximately 300 yards to the east of the transfer building. Weather was rainy and cool.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	240,000
Total Sample Weight (lbs)	2,911.1
Significance Test Results	.000
Number of Samples	12

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	1	Beauty/Hygiene Aerosol Products	1
Prescription Medication (Rx)	25	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	8	Gardening/Yard Care Products	1
Household Cleaning Products	1	Pet Groom Products	0
Sharps/Blades	1	Disposable Razors	7
Syringes	0	Alkaline Batteries	3
Hardware/Shop Products	0	Automobile Maintenance/Cleaning Products	1
Aerosol Cans	0		
Miscellaneous items: 1 refrigerator muffler, 1 bottle of liquid paper.			



**ST. FRANCOIS COUNTY**  
**SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	166	56.5	100%	0%	Drop-off	Farmington
2	257	65.3	100%	0%	Drop-off	Park Hills
3	304	51.5	100%	0%	Drop-off	Desloge
4	323.5	56.6	100%	0%	Drop-off	Park Hills
5	324.1	63	100%	0%	Drop-off	Park Hills
6	258.5	45.8	100%	0%	Drop-off	Bonne Terre
7	277	55.8	100%	0%	Drop-off	Desloge
8	296	56.7	100%	0%	Drop-off	Iron County Lake
9	246	51.2	50%	50%	Drop-off	Iron County Lake
10	184	34	100%	0%	Drop-off	Desloge
11	149	28	100%	0%	Drop-off	Park Hills
12	126	26	100%	0%	Drop-off	Bonne Terre
<b>TOTALS</b>	<b>2911.1</b>	<b>590.4</b>				
<b>AVERAGE</b>	<b>242.6</b>	<b>49.2</b>	<b>96%</b>	<b>4%</b>		

TABLE 6-5

**ST. FRANCOIS COUNTY**

**SORT #3**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	206.0	66.2	17.2	5.5	7.08%	11.21%
Newsprint	215.0	31.0	17.9	2.6	7.39%	5.25%
Magazines	105.0	10.5	8.8	0.9	3.61%	1.78%
High Grade	71.0	12.2	5.9	1.0	2.44%	2.07%
Mixed	327.0	77.8	27.3	6.5	11.24%	13.18%
<b>PAPER TOTALS</b>	<b>924.0</b>	<b>197.7</b>	<b>77.0</b>	<b>16.5</b>	<b>31.77%</b>	<b>33.49%</b>
Clear	111.5	11.5	9.3	1.0	3.83%	1.95%
Brown	62.0	5.8	5.2	0.5	2.13%	0.98%
Green	3.5	0.4	0.3	0.0	0.12%	0.07%
Other	17.1	2.1	1.4	0.2	0.59%	0.36%
<b>GLASS TOTALS</b>	<b>194.1</b>	<b>19.8</b>	<b>16.2</b>	<b>1.7</b>	<b>6.67%</b>	<b>3.35%</b>
Alum. Cans	37.0	16.5	3.1	1.4	1.27%	2.79%
Other Alum	15.5	5.6	1.3	0.5	0.53%	0.95%
Non ferrous	12.0	2.4	1.0	0.2	0.41%	0.41%
Food Cans	100.5	18.9	8.4	1.6	3.46%	3.20%
Ferrous	41.0	7.3	3.4	0.6	1.41%	1.24%
Oil Filters	3.0	0.2	0.3	0.0	0.10%	0.03%
<b>METAL TOTALS</b>	<b>209.0</b>	<b>50.9</b>	<b>17.4</b>	<b>4.2</b>	<b>7.19%</b>	<b>8.62%</b>
PET # 1	44.5	22.4	3.7	1.9	1.53%	3.79%
HDPE # 2	74.0	37.6	6.2	3.1	2.54%	6.37%
Film	83.0	42.0	6.9	3.5	2.85%	7.11%
Other Plastic	220.0	83.7	18.3	7.0	7.57%	14.18%
<b>PLASTIC TOTALS</b>	<b>421.5</b>	<b>185.7</b>	<b>35.1</b>	<b>15.5</b>	<b>14.49%</b>	<b>31.46%</b>
Food Waste	610.0	55.2	50.8	4.6	20.98%	9.35%
Wood Waste	17.0	3.3	1.4	0.3	0.58%	0.56%
Textiles	242.0	37.9	20.2	3.2	8.32%	6.42%
Diapers	85.5	9.8	7.1	0.8	2.94%	1.66%
Other Organics	120.0	19.2	10.0	1.6	4.13%	3.25%
<b>ORGANIC TOTALS</b>	<b>1074.5</b>	<b>125.4</b>	<b>89.5</b>	<b>10.5</b>	<b>36.95%</b>	<b>21.24%</b>
Fines	57.0	8.6	4.8	0.7	1.96%	1.45%
Other Inorganics	28.0	2.3	2.3	0.2	0.96%	0.39%
<b>INORGANIC TOTALS</b>	<b>85.0</b>	<b>10.9</b>	<b>7.1</b>	<b>0.9</b>	<b>2.92%</b>	<b>1.84%</b>
<b>TOTAL SORT</b>	<b>2908.1</b>	<b>590.4</b>	<b>242.3</b>	<b>49.2</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 6-6



## **SORT SUMMARY**

### **Seasonal variations**

- Food waste was lower in the first round. No obvious cause.
- Diapers were higher in the first round. No obvious cause.
- Other organics were higher in the second and third round due to yard waste.
- Fines were higher in the first round. Modification in the sorting procedure caused more of the fines to be sorted into the appropriate categories in the second and third round.

### **Sort results**

- Chart 6-1 graphically compares the three seasonal waste sort results and shows the average waste composition, by major category, for St. Francois County.
- The sample data for all St. Francois County sorts is listed on table 6-7.
- The sort results for all St. Francois County sorts are listed on table 6-8.
- The summary of statistical relevance for the St. Francois County sorts is located on page 90.
- The total for all “other wastes” found during the St. Francois County sorts is on page 90.

**All weights are in pounds and volumes are listed in cubic feet.**

Comparisons of the St. Francois County waste stream to previous studies and other communities can be found in chapter 13.

# ST. FRANCOIS COUNTY

# SORT #3

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	206.0	66.2	17.2	5.5	7.08%	11.21%
Newsprint	215.0	31.0	17.9	2.6	7.39%	5.25%
Magazines	105.0	10.5	8.8	0.9	3.61%	1.78%
High Grade	71.0	12.2	5.9	1.0	2.44%	2.07%
Mixed	327.0	77.8	27.3	6.5	11.24%	13.18%
<b>PAPER TOTALS</b>	<b>924.0</b>	<b>197.7</b>	<b>77.0</b>	<b>16.5</b>	<b>31.77%</b>	<b>33.49%</b>
Clear	111.5	11.5	9.3	1.0	3.83%	1.95%
Brown	62.0	5.8	5.2	0.5	2.13%	0.98%
Green	3.5	0.4	0.3	0.0	0.12%	0.07%
Other	17.1	2.1	1.4	0.2	0.59%	0.36%
<b>GLASS TOTALS</b>	<b>194.1</b>	<b>19.8</b>	<b>16.2</b>	<b>1.7</b>	<b>6.67%</b>	<b>3.35%</b>
Alum. Cans	37.0	16.5	3.1	1.4	1.27%	2.79%
Other Alum	15.5	5.6	1.3	0.5	0.53%	0.95%
Non ferrous	12.0	2.4	1.0	0.2	0.41%	0.41%
Food Cans	100.5	18.9	8.4	1.6	3.46%	3.20%
Ferrous	41.0	7.3	3.4	0.6	1.41%	1.24%
Oil Filters	3.0	0.2	0.3	0.0	0.10%	0.03%
<b>METAL TOTALS</b>	<b>209.0</b>	<b>50.9</b>	<b>17.4</b>	<b>4.2</b>	<b>7.19%</b>	<b>8.62%</b>
PET # 1	44.5	22.4	3.7	1.9	1.53%	3.79%
HDPE # 2	74.0	37.6	6.2	3.1	2.54%	6.37%
Film	83.0	42.0	6.9	3.5	2.85%	7.11%
Other Plastic	220.0	83.7	18.3	7.0	7.57%	14.18%
<b>PLASTIC TOTALS</b>	<b>421.5</b>	<b>185.7</b>	<b>35.1</b>	<b>15.5</b>	<b>14.49%</b>	<b>31.46%</b>
Food Waste	610.0	55.2	50.8	4.6	20.98%	9.35%
Wood Waste	17.0	3.3	1.4	0.3	0.58%	0.56%
Textiles	242.0	37.9	20.2	3.2	8.32%	6.42%
Diapers	85.5	9.8	7.1	0.8	2.94%	1.66%
Other Organics	120.0	19.2	10.0	1.6	4.13%	3.25%
<b>ORGANIC TOTALS</b>	<b>1074.5</b>	<b>125.4</b>	<b>89.5</b>	<b>10.5</b>	<b>36.95%</b>	<b>21.24%</b>
Fines	57.0	8.6	4.8	0.7	1.96%	1.45%
Other Inorganics	28.0	2.3	2.3	0.2	0.96%	0.39%
<b>INORGANIC TOTALS</b>	<b>85.0</b>	<b>10.9</b>	<b>7.1</b>	<b>0.9</b>	<b>2.92%</b>	<b>1.84%</b>
<b>TOTAL SORT</b>	<b>2908.1</b>	<b>590.4</b>	<b>242.3</b>	<b>49.2</b>	<b>100.00%</b>	<b>100.00%</b>



## **SORT SUMMARY**

### **Seasonal variations**

- Food waste was lower in the first round. No obvious cause.
- Diapers were higher in the first round. No obvious cause.
- Other organics were higher in the second and third round due to yard waste.
- Fines were higher in the first round. Modification in the sorting procedure caused more of the fines to be sorted into the appropriate categories in the second and third round.

### **Sort results**

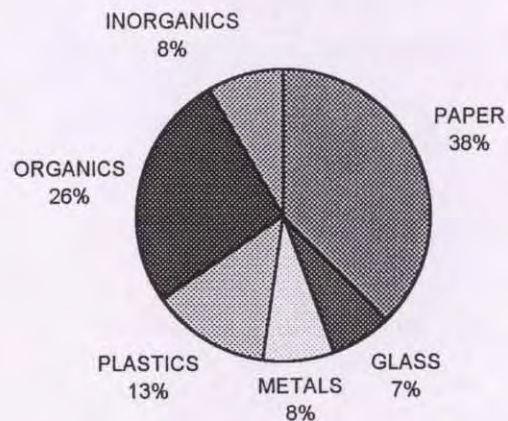
- Chart 6-1 graphically compares the three seasonal waste sort results and shows the average waste composition, by major category, for St. Francois County.
- The sample data for all St. Francois County sorts is listed on table 6-7.
- The sort results for all St. Francois County sorts are listed on table 6-8.
- The summary of statistical relevance for the St. Francois County sorts is located on page 90.
- The total for all “other wastes” found during the St. Francois County sorts is on page 90.

**All weights are in pounds and volumes are listed in cubic feet.**

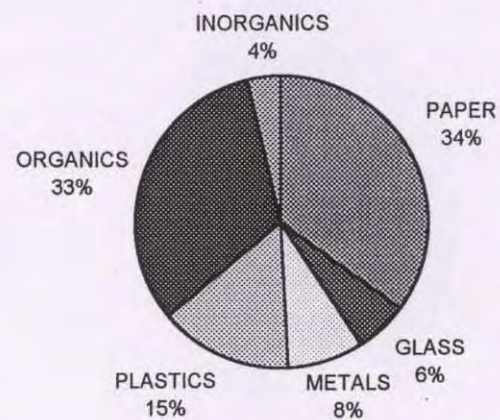
Comparisons of the St. Francois County waste stream to previous studies and other communities can be found in chapter 13.

## ST. FRANCOIS COUNTY RESULTS BY WEIGHT

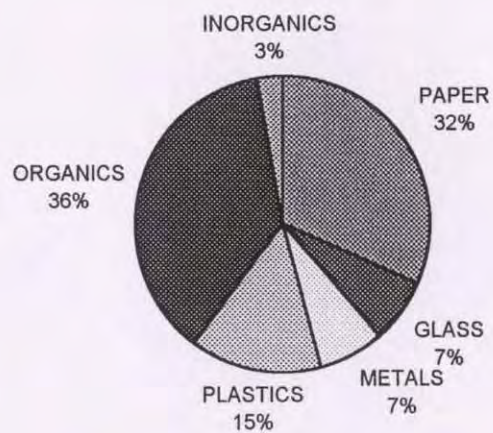
**SORT #1**



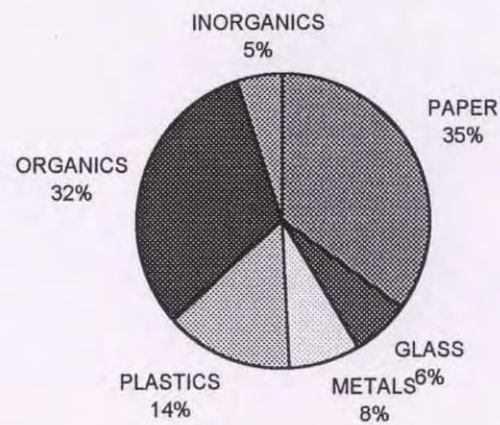
**SORT #2**



**SORT #3**



**SORT AVERAGE**





# **ST. FRANCOIS COUNTY SAMPLE SUMMARY**

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	2/26-2/28	15	3228.0	721.8	91%	9%
2	6/3-6/5	12	2714.4	564.6	75%	25%
3	9/23-9/25	12	2911.1	590.4	96%	4%
<b>TOTALS</b>		<b>39.0</b>	<b>8853.5</b>	<b>1876.8</b>		
<b>AVERAGE</b>		<b>13.0</b>	<b>2951.2</b>	<b>625.6</b>	<b>87%</b>	<b>13%</b>

TABLE 6-7

<b>ST. FRANCOIS COUNTY</b>							<b>SUMMARY</b>	
<b>CATEGORY</b>	<b>SORT # 1</b>		<b>SORT # 2</b>		<b>SORT # 3</b>		<b>AVERAGE</b>	
	<b>WT.</b>	<b>VOL.</b>	<b>WT.</b>	<b>VOL.</b>	<b>WT.</b>	<b>VOL.</b>	<b>WT.</b>	<b>VOL.</b>
Cardboard	7.1%	11.3%	6.5%	11.9%	7.1%	11.2%	6.9%	11.4%
Newsprint	5.9%	5.4%	6.6%	5.0%	7.4%	5.2%	6.6%	5.2%
Magazines	3.5%	2.0%	4.6%	1.9%	3.6%	1.9%	3.9%	1.9%
High Grade	2.2%	2.3%	3.9%	3.1%	2.4%	2.0%	2.8%	2.5%
Mixed	19.0%	18.2%	13.3%	16.8%	11.2%	13.2%	14.7%	16.2%
<b>PAPER TOTALS</b>	<b>37.6%</b>	<b>39.2%</b>	<b>35.0%</b>	<b>38.7%</b>	<b>31.8%</b>	<b>33.5%</b>	<b>34.9%</b>	<b>37.2%</b>
Clear	4.6%	2.3%	3.2%	1.3%	3.8%	2.0%	3.9%	1.9%
Brown	1.6%	0.9%	1.8%	0.7%	2.1%	1.0%	1.9%	0.9%
Green	0.3%	0.2%	0.3%	0.2%	0.1%	0.1%	0.2%	0.2%
Other	0.5%	0.3%	0.4%	0.1%	0.6%	0.4%	0.5%	0.3%
<b>GLASS TOTALS</b>	<b>7.0%</b>	<b>3.8%</b>	<b>5.7%</b>	<b>2.3%</b>	<b>6.7%</b>	<b>3.4%</b>	<b>6.5%</b>	<b>3.2%</b>
Alum. Cans	1.5%	3.3%	2.1%	2.8%	1.3%	2.9%	1.6%	3.0%
Other Alum	0.6%	1.2%	1.2%	0.9%	0.5%	0.9%	0.8%	1.1%
Non ferrous	0.2%	0.2%	0.2%	0.1%	0.4%	0.4%	0.3%	0.2%
Food Cans	4.5%	4.1%	3.6%	2.8%	3.5%	3.2%	3.9%	3.4%
Ferrous	0.8%	0.6%	1.4%	0.9%	1.4%	1.2%	1.2%	0.9%
Oil Filters	0.2%	0.1%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%
<b>METAL TOTALS</b>	<b>7.8%</b>	<b>9.5%</b>	<b>8.4%</b>	<b>7.4%</b>	<b>7.2%</b>	<b>8.7%</b>	<b>7.8%</b>	<b>8.6%</b>
PET # 1	1.7%	5.0%	2.0%	3.9%	1.5%	3.7%	1.8%	4.3%
HDPE # 2	2.3%	6.2%	2.4%	5.3%	2.5%	6.4%	2.4%	6.0%
Film	3.4%	7.0%	3.8%	10.0%	2.9%	7.1%	3.3%	7.9%
Other Plastic	5.7%	11.2%	6.5%	12.6%	7.6%	14.2%	6.6%	12.6%
<b>PLASTIC TOTALS</b>	<b>13.1%</b>	<b>29.3%</b>	<b>14.8%</b>	<b>31.9%</b>	<b>14.5%</b>	<b>31.4%</b>	<b>14.1%</b>	<b>30.8%</b>
Food Waste	14.1%	5.0%	19.1%	8.7%	21.0%	9.3%	17.9%	7.5%
Wood Waste	0.6%	0.4%	1.1%	0.5%	0.6%	0.6%	0.7%	0.5%
Textiles	4.6%	4.7%	5.4%	3.7%	8.3%	6.4%	6.1%	4.9%
Diapers	5.9%	3.1%	3.6%	1.9%	2.9%	1.7%	4.2%	2.3%
Other Organics	0.9%	1.4%	3.4%	3.0%	4.1%	3.2%	2.7%	2.5%
<b>ORGANIC TOTALS</b>	<b>26.1%</b>	<b>14.6%</b>	<b>32.6%</b>	<b>17.7%</b>	<b>36.9%</b>	<b>21.1%</b>	<b>31.7%</b>	<b>17.6%</b>
Fines	7.5%	3.2%	2.3%	1.5%	2.0%	1.5%	4.1%	2.2%
Other Inorganics	1.0%	0.4%	1.2%	0.4%	1.0%	0.4%	1.0%	0.4%
<b>INORGANIC TOTALS</b>	<b>8.4%</b>	<b>3.6%</b>	<b>3.5%</b>	<b>2.0%</b>	<b>2.9%</b>	<b>1.8%</b>	<b>5.1%</b>	<b>2.6%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 6-8



St. Francois County Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	240,000
Total Sample Weight (lbs)	8,853.5
Total Number of Samples Collected	39
Significance Test Results	.000
Mean Sample (lbs) and Confidence Interval (95%)	227.01 (+/-) 16.75

St. Francois County "Other Waste" Summary			
Over-the-Counter Medication (OTC)	3	Beauty/Hygiene Aerosol Products	0
Prescription Medication (Rx)	31	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	21	Gardening/Yard Care Products	3
Household Cleaning Products	2	Pet Groom Products	0
Sharps/Blades	6	Disposable Razors	53
Syringes	70	Alkaline Batteries	47
Hardware/Shop Products	5	Automobile Maintenance/Cleaning Products	3
Aerosol Cans	1		
<b>Miscellaneous items:</b> 1 package of fish attractant, 1 bottle hair color, 1 bottle lighter fluid, 2 shotgun shells, 1 container of propane, 1 refrigerator muffler, 1 bottle of liquid paper.			

## Chapter 7: St. Louis

### COMMUNITY PROFILE

St. Louis is the largest city in Missouri. It is very urban and is surrounded by St. Louis County which is made up of almost 100 suburbs and unincorporated areas. There are approximately 165,000 occupied households in St. Louis. Slightly more than half of these units are single-family dwellings, and the rest multi-family dwellings. The City of St. Louis Refuse Division collects approximately 177,000 tons of trash from residents each year.

The City of St. Louis owns two Transfer stations. Both are operated by Allied Waste System (formerly Laidlaw). The sampling for all three waste sorts was conducted at the South transfer station. The samples taken at the south St. Louis station represent a wide variety of areas and a wide range of demographics within the city. The City of St. Louis is a member of the St. Louis-Jefferson Solid Waste Management District ( District L).

The City of St. Louis is 215 miles Northwest of Springfield and 252 miles east of Kansas City.

#### Demographics:

	St. Louis
Area (sq. miles)	62
Population (1992)	383,733
Density (per sq. mile)	6199
Pop. Change since 1980	-15.3%
Number of households	164,931
Persons per household	2.34
High school graduates	62.8%
Median Family Income	\$24,274
Percent below poverty level	24.6%



### *Solid waste collection*

All residential trash in St. Louis is collected by the City of St. Louis. Collection and disposal are financed by the general revenue fund and there are no direct user fees to the residents. All residents are provided with a 90 gallon container, or have access to a 2 cubic yard container in an alley. The containers are emptied twice a week by the City with automated trucks.

### *Solid waste disposal*

Solid waste is shipped to the Allied Waste landfill in Illinois. St. Louis refuse trucks and Allied trucks serving commercial accounts are the only waste using the transfer station therefore tipping fees are not applicable. All samples were taken from City of St. Louis refuse trucks.

### *Waste reduction and recycling programs*

The City of St. Louis operates twenty-four neighborhood drop-off recycling sites which are available to residents 24 hours a day, seven days a week.. The City currently has no city-wide curbside recycling programs. However, a curbside pilot program is being tried in the Central West End. Private recyclers provide some curbside recycling to a small percentage of homes throughout the City. An estimated 4% of the residential waste stream is being recycled

The City operates a composting program for yard waste. Yard wastes are collected once a week.

### *St. Louis Results*

Information about sample size and composition are listed in tables 7-1 through 7-8

**All weights are listed in pounds and all volumes are in cubic feet.**



## **SORT #1**

### **Sort Conditions**

The first sort was conducted March 11th through the 15th. The sort facility was set up in a grassy, shaded area across from the main administrative building. Weather conditions were sunny and mild for all scheduled days.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	372,000
Total Sample Weight (lbs)	2,348.35
Significance Test Results	.000
Number of Samples	16

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	2	Beauty/Hygiene Aerosol Products	5
Prescription Medication (Rx)	4	Household Cleaning Aerosol Products	2
Beauty/Hygiene Products	15	Gardening/Yard Care Products	1
Household Cleaning Products	2	Pet Groom Products	1
Sharps/Blades	4	Disposable Razors	14
Syringes	7	Alkaline Batteries	19
Hardware/Shop Products	7	Automobile Maintenance/Cleaning Products	3
Aerosol Cans	3		
Miscellaneous items: 1 full disposable lighter, 1 bottle of hair dye.			



# ST. LOUIS

## SORT #1

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	177	42.2	100%	0%	Drop-off	South St. Louis
2	153	55.3	100%	0%	Drop-off	South St. Louis
3	143	36.8	100%	0%	Drop-off	South St. Louis
4	150.7	32.4	100%	0%	Drop-off	South St. Louis
5	103.9	30.79	100%	0%	Drop-off	South St. Louis
6	134.6	33.4	100%	0%	Drop-off	South St. Louis
7	102	30.1	100%	0%	Drop-off	South St. Louis
8	140	33.1	100%	0%	Drop-off	South St. Louis
9	110	32.1	100%	0%	Drop-off	South St. Louis
10	144	40.2	100%	0%	Drop-off	South St. Louis
11	149	33.8	100%	0%	Drop-off	South St. Louis
12	133.5	42	100%	0%	Drop-off	South St. Louis
13	162.3	33	100%	0%	Drop-off	South St. Louis
14	202.2	42.3	100%	0%	Drop-off	South St. Louis
15	165.9	33.6	100%	0%	Drop-off	South St. Louis
16	177.25	34.8	100%	0%	Drop-off	South St. Louis
<b>TOTALS</b>	<b>2348.4</b>	<b>585.9</b>				
<b>AVERAGE</b>	<b>146.8</b>	<b>36.6</b>	<b>100%</b>	<b>0%</b>		

TABLE 7-1

**ST. LOUIS****SORT #1**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	102.5	53.8	6.4	3.4	4.34%	9.14%
Newsprint	269.0	41.3	16.8	2.6	11.39%	7.01%
Magazines	77.3	10.2	4.8	0.6	3.27%	1.73%
High Grade	36.7	12.7	2.3	0.8	1.56%	2.15%
Mixed	319.3	85.3	20.0	5.3	13.52%	14.49%
<b>PAPER TOTALS</b>	<b>804.8</b>	<b>203.1</b>	<b>50.3</b>	<b>12.7</b>	<b>34.08%</b>	<b>34.53%</b>
Clear	100.5	10.7	6.3	0.7	4.26%	1.81%
Brown	69.6	8.8	4.4	0.6	2.95%	1.50%
Green	23.1	2.6	1.4	0.2	0.98%	0.44%
Other	11.2	0.9	0.7	0.1	0.47%	0.14%
<b>GLASS TOTALS</b>	<b>204.4</b>	<b>22.9</b>	<b>12.8</b>	<b>1.4</b>	<b>8.65%</b>	<b>3.89%</b>
Alum. Cans	34.7	22.2	2.2	1.4	1.47%	3.77%
Other Alum	10.6	10.6	0.7	0.7	0.45%	1.79%
Non ferrous	9.1	1.2	0.6	0.1	0.38%	0.20%
Food Cans	72.3	18.0	4.5	1.1	3.06%	3.06%
Ferrous	18.0	5.2	1.1	0.3	0.76%	0.88%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>144.7</b>	<b>57.1</b>	<b>9.0</b>	<b>3.6</b>	<b>6.13%</b>	<b>9.70%</b>
PET # 1	27.2	37.5	1.7	2.3	1.15%	6.37%
HDPE # 2	43.3	39.1	2.7	2.4	1.83%	6.65%
Film	76.5	50.1	4.8	3.1	3.24%	8.52%
Other Plastic	132.0	65.7	8.2	4.1	5.59%	11.17%
<b>PLASTIC TOTALS</b>	<b>279.0</b>	<b>192.4</b>	<b>17.4</b>	<b>12.0</b>	<b>11.81%</b>	<b>32.71%</b>
Food Waste	396.3	35.5	24.8	2.2	16.78%	6.03%
Wood Waste	8.6	1.6	0.5	0.1	0.37%	0.26%
Textiles	82.5	22.8	5.2	1.4	3.49%	3.87%
Diapers	119.0	12.8	7.4	0.8	5.04%	2.18%
Other Organics	61.8	9.6	3.9	0.6	2.62%	1.64%
<b>ORGANIC TOTALS</b>	<b>668.3</b>	<b>82.2</b>	<b>41.8</b>	<b>5.1</b>	<b>28.30%</b>	<b>13.98%</b>
Fines	221.3	28.3	13.8	1.8	9.37%	4.80%
Other Inorganics	39.3	2.3	2.5	0.1	1.66%	0.39%
<b>INORGANIC TOTALS</b>	<b>260.5</b>	<b>30.6</b>	<b>16.3</b>	<b>1.9</b>	<b>11.03%</b>	<b>5.20%</b>
<b>TOTAL SORT</b>	<b>2361.6</b>	<b>588.3</b>	<b>147.6</b>	<b>36.8</b>	<b>100.00%</b>	<b>100.00%</b>





## **SORT # 2**

### **Sort Conditions**

The second sort was conducted June 17th through the 19th. The sort facility was set up in the same location as Sort # 1. Weather conditions were sunny and very warm.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	372,000
<b>Total Sample Weight (lbs)</b>	2,542.7
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	2	<b>Beauty/Hygiene Aerosol Products</b>	1
<b>Prescription Medication (Rx)</b>	1	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	9	<b>Gardening/Yard Care Products</b>	1
<b>Household Cleaning Products</b>	1	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	2	<b>Disposable Razors</b>	8
<b>Syringes</b>	3	<b>Alkaline Batteries</b>	3
<b>Hardware/Shop Products</b>	0	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	1		
<b>Miscellaneous items: None.</b>			



**ST. LOUIS**  
**SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	221	45	100%	0%	Drop-off	South St. Louis
2	205	39.2	100%	0%	Drop-off	South St. Louis
3	232	49.5	100%	0%	Drop-off	South St. Louis
4	199	41.8	100%	0%	Drop-off	South St. Louis
5	256.5	58.2	100%	0%	Drop-off	South St. Louis
6	213.2	46.8	100%	0%	Drop-off	South St. Louis
7	199	38.6	100%	0%	Drop-off	South St. Louis
8	191	47.9	100%	0%	Drop-off	South St. Louis
9	184	42.4	100%	0%	Drop-off	South St. Louis
10	188	39	100%	0%	Drop-off	South St. Louis
11	238	53.8	100%	0%	Drop-off	South St. Louis
12	216	38.5	100%	0%	Drop-off	South St. Louis
<b>TOTALS</b>	<b>2542.7</b>	<b>540.7</b>				
<b>AVERAGE</b>	<b>211.9</b>	<b>45.1</b>	<b>100%</b>	<b>0%</b>		

TABLE 7-3

## ST. LOUIS

## SORT # 2

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	115.0	52.0	9.6	4.3	4.52%	9.62%
Newsprint	285.5	42.5	23.8	3.5	11.23%	7.86%
Magazines	53.5	6.6	4.5	0.6	2.10%	1.22%
High Grade	96.5	18.9	8.0	1.6	3.80%	3.50%
Mixed	393.0	105.5	32.8	8.8	15.46%	19.52%
<b>PAPER TOTALS</b>	<b>943.5</b>	<b>225.5</b>	<b>78.6</b>	<b>18.8</b>	<b>37.12%</b>	<b>41.72%</b>
Clear	98.0	7.9	8.2	0.7	3.86%	1.45%
Brown	56.4	4.3	4.7	0.4	2.22%	0.80%
Green	10.0	0.7	0.8	0.1	0.39%	0.13%
Other	26.5	2.6	2.2	0.2	1.04%	0.48%
<b>GLASS TOTALS</b>	<b>190.9</b>	<b>15.5</b>	<b>15.9</b>	<b>1.3</b>	<b>7.51%</b>	<b>2.86%</b>
Alum. Cans	39.5	18.3	3.3	1.5	1.55%	3.39%
Other Alum	22.5	5.2	1.9	0.4	0.89%	0.96%
Non ferrous	6.5	0.6	0.5	0.1	0.26%	0.11%
Food Cans	66.9	12.5	5.6	1.0	2.63%	2.31%
Ferrous	34.5	2.7	2.9	0.2	1.36%	0.50%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>169.9</b>	<b>39.3</b>	<b>14.2</b>	<b>3.3</b>	<b>6.68%</b>	<b>7.27%</b>
PET # 1	38.5	15.2	3.2	1.3	1.51%	2.81%
HDPE # 2	42.5	21.5	3.5	1.8	1.67%	3.98%
Film	81.5	49.0	6.8	4.1	3.21%	9.06%
Other Plastic	171.0	66.8	14.3	5.6	6.73%	12.35%
<b>PLASTIC TOTALS</b>	<b>333.5</b>	<b>152.5</b>	<b>27.8</b>	<b>12.7</b>	<b>13.12%</b>	<b>28.20%</b>
Food Waste	501.0	49.5	41.8	4.1	19.71%	9.16%
Wood Waste	7.0	0.8	0.6	0.1	0.28%	0.15%
Textiles	96.0	18.9	8.0	1.6	3.78%	3.50%
Diapers	91.5	10.3	7.6	0.9	3.60%	1.90%
Other Organics	82.5	11.4	6.9	1.0	3.25%	2.11%
<b>ORGANIC TOTALS</b>	<b>778.0</b>	<b>90.9</b>	<b>64.8</b>	<b>7.6</b>	<b>30.61%</b>	<b>16.81%</b>
Fines	53.8	10.0	4.5	0.8	2.12%	1.85%
Other Inorganics	72.0	7.0	6.0	0.6	2.83%	1.29%
<b>INORGANIC TOTALS</b>	<b>125.8</b>	<b>17.0</b>	<b>10.5</b>	<b>1.4</b>	<b>4.95%</b>	<b>3.14%</b>
<b>TOTAL SORT</b>	<b>2541.6</b>	<b>540.6</b>	<b>211.8</b>	<b>45.0</b>	<b>100.00%</b>	<b>100.00%</b>





### **SORT # 3**

#### **Sort Conditions**

The third sort was conducted on September 30th through October 2nd. The sort facility was set up in the same location as Sort # 1 and 2. Weather conditions were sunny and mild.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	372,000
Total Sample Weight (lbs)	2,257.5
Significance Test Results	.000
Number of Samples	

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	8	Beauty/Hygiene Aerosol Products	0
Prescription Medication (Rx)	5	Household Cleaning Aerosol Products	4
Beauty/Hygiene Products	52	Gardening/Yard Care Products	0
Household Cleaning Products	1	Pet Groom Products	0
Sharps/Blades	0	Disposable Razors	5
Syringes	1	Alkaline Batteries	9
Hardware/Shop Products	0	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	0		
Miscellaneous items: 1 lighter.			



**ST. LOUIS  
SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	232	46.6	100%	0%	Drop-off	South St. Louis
2	124	37.4	100%	0%	Drop-off	South St. Louis
3	134	36.6	100%	0%	Drop-off	South St. Louis
4	205	42.6	100%	0%	Drop-off	South St. Louis
5	183	37.8	100%	0%	Drop-off	South St. Louis
6	193	48.4	100%	0%	Drop-off	South St. Louis
7	198	48.1	100%	0%	Drop-off	South St. Louis
8	229	50.4	100%	0%	Drop-off	South St. Louis
9	200	36.1	100%	0%	Drop-off	South St. Louis
10	173	46.7	100%	0%	Drop-off	South St. Louis
11	222	42.6	100%	0%	Drop-off	South St. Louis
12	164.5	42.3	100%	0%	Drop-off	South St. Louis
<b>TOTALS</b>	<b>2257.5</b>	<b>515.6</b>				
<b>AVERAGE</b>	<b>188.1</b>	<b>43.0</b>	<b>100%</b>	<b>0%</b>		

TABLE 7-5

## ST. LOUIS

## SORT # 3

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	96.0	52.5	8.0	4.4	4.26%	10.40%
Newsprint	398.0	47.1	33.2	3.9	17.65%	9.33%
Magazines	80.9	11.2	6.7	0.9	3.59%	2.22%
High Grade	64.5	12.9	5.4	1.1	2.86%	2.55%
Mixed	226.0	76.2	18.8	6.4	10.02%	15.09%
<b>PAPER TOTALS</b>	<b>865.4</b>	<b>199.9</b>	<b>72.1</b>	<b>16.7</b>	<b>38.38%</b>	<b>39.59%</b>
Clear	73.0	6.6	6.1	0.6	3.24%	1.31%
Brown	31.2	3.4	2.6	0.3	1.38%	0.67%
Green	14.5	1.8	1.2	0.2	0.64%	0.36%
Other	11.6	1.6	1.0	0.1	0.51%	0.32%
<b>GLASS TOTALS</b>	<b>130.3</b>	<b>13.4</b>	<b>10.9</b>	<b>1.1</b>	<b>5.78%</b>	<b>2.65%</b>
Alum. Cans	30.0	13.1	2.5	1.1	1.33%	2.59%
Other Alum	17.1	4.6	1.4	0.4	0.76%	0.91%
Non ferrous	2.5	1.2	0.2	0.1	0.11%	0.24%
Food Cans	46.5	8.5	3.9	0.7	2.06%	1.68%
Ferrous	35.5	4.9	3.0	0.4	1.57%	0.97%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>131.6</b>	<b>32.3</b>	<b>11.0</b>	<b>2.7</b>	<b>5.84%</b>	<b>6.40%</b>
PET # 1	30.5	13.4	2.5	1.1	1.35%	2.65%
HDPE # 2	36.3	22.1	3.0	1.8	1.61%	4.38%
Film	51.0	40.0	4.3	3.3	2.26%	7.92%
Other Plastic	160.5	70.0	13.4	5.8	7.12%	13.86%
<b>PLASTIC TOTALS</b>	<b>278.3</b>	<b>145.5</b>	<b>23.2</b>	<b>12.1</b>	<b>12.34%</b>	<b>28.82%</b>
Food Waste	389.5	45.0	32.5	3.8	17.27%	8.91%
Wood Waste	24.5	3.4	2.0	0.3	1.09%	0.67%
Textiles	113.5	21.8	9.5	1.8	5.03%	4.32%
Diapers	61.0	8.7	5.1	0.7	2.70%	1.72%
Other Organics	211.5	25.4	17.6	2.1	9.38%	5.03%
<b>ORGANIC TOTALS</b>	<b>800.0</b>	<b>104.3</b>	<b>66.7</b>	<b>8.7</b>	<b>35.48%</b>	<b>20.66%</b>
Fines	33.5	7.5	2.8	0.6	1.49%	1.49%
Other Inorganics	16.0	2.0	1.3	0.2	0.71%	0.40%
<b>INORGANIC TOTALS</b>	<b>49.5</b>	<b>9.5</b>	<b>4.1</b>	<b>0.8</b>	<b>2.20%</b>	<b>1.88%</b>
<b>TOTAL SORT</b>	<b>2255.1</b>	<b>504.9</b>	<b>187.9</b>	<b>42.1</b>	<b>100.00%</b>	<b>100.00%</b>



## **SORT SUMMARY**

### **Seasonal variations**

- Newspapers were higher in the third sort. No obvious cause.
- Other organics were considerably higher during the third sort. Several bags of yard waste were found.
- Fines were higher in the first round. Modification in the sorting procedure caused more of the fines to be sorted into the appropriate categories in the second and third round.

### **Sort results**

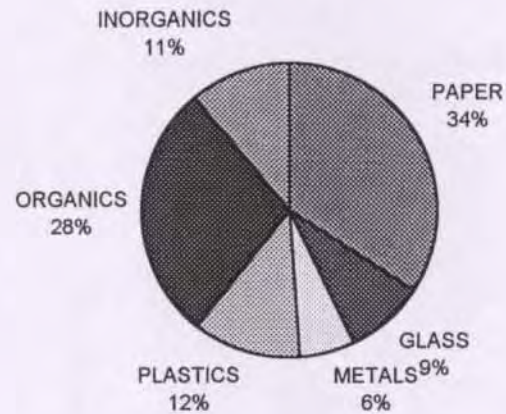
- Chart 7-1 graphically compares the three seasonal waste sort results and shows the average waste composition, by major category, for St. Louis.
- The sample data for all St. Louis sorts is listed on table 7-7.
- The sort results for all St. Louis sorts are listed on table 7-8.
- The summary of statistical relevance for the St. Louis sorts is located on page 108.
- The total for all “other wastes” found during the St. Louis sorts is on page 108.

**All weights are in pounds and volumes are listed in cubic feet.**

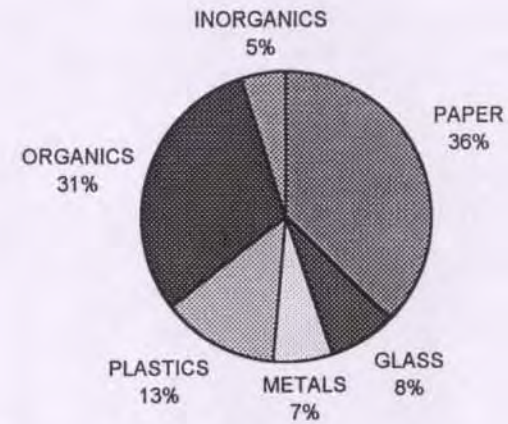
Comparisons of the St. Louis waste stream to previous studies and other communities can be found in chapter 13.

## ST. LOUIS RESULTS BY WEIGHT

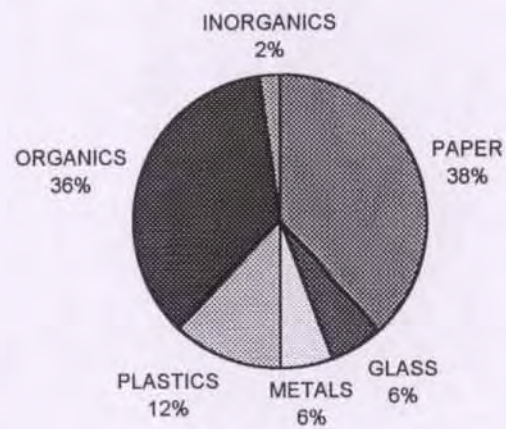
**SORT #1**



**SORT #2**



**SORT #3**



**SORT AVERAGE**

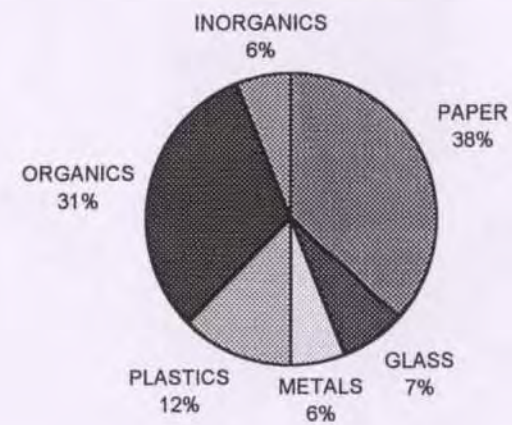


CHART 7-1



# ST. LOUIS

## SAMPLE SUMMARY

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	3/11-3/13	16	2348.4	585.9	100%	0%
2	6/17-6/19	12	2542.7	540.7	100%	0%
3	9/30-10/2	12	2257.5	515.6	100%	0%
TOTALS		40.0	7148.6	1642.2		

TABLE 7-7

CATEGORY	ST. LOUIS						SUMMARY	
	SORT # 1		SORT # 2		SORT #3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	4.3%	9.1%	4.5%	9.6%	4.3%	10.4%	4.4%	9.7%
Newsprint	11.4%	7.0%	11.2%	7.9%	17.6%	9.3%	13.3%	8.0%
Magazines	3.3%	1.7%	2.1%	1.2%	3.6%	2.2%	3.0%	1.7%
High Grade	1.6%	2.2%	3.8%	3.5%	2.9%	2.6%	2.8%	2.7%
Mixed	13.5%	14.5%	15.5%	19.5%	10.0%	15.1%	13.1%	16.3%
<b>PAPER TOTALS</b>	<b>34.1%</b>	<b>34.5%</b>	<b>37.1%</b>	<b>41.7%</b>	<b>38.4%</b>	<b>39.6%</b>	<b>36.5%</b>	<b>38.5%</b>
Clear	4.3%	1.8%	3.9%	1.5%	3.2%	1.3%	3.8%	1.5%
Brown	2.9%	1.5%	2.2%	0.8%	1.4%	0.7%	2.2%	1.0%
Green	1.0%	0.4%	0.4%	0.1%	0.6%	0.4%	0.7%	0.3%
Other	0.5%	0.2%	1.0%	0.5%	0.5%	0.3%	0.7%	0.3%
<b>GLASS TOTALS</b>	<b>8.7%</b>	<b>3.9%</b>	<b>7.5%</b>	<b>2.9%</b>	<b>5.8%</b>	<b>2.7%</b>	<b>7.3%</b>	<b>3.2%</b>
Alum. Cans	1.5%	3.8%	1.6%	3.4%	1.3%	2.6%	1.5%	3.3%
Other Alum	0.4%	1.8%	0.9%	1.0%	0.8%	0.9%	0.7%	1.2%
Non ferrous	0.4%	0.2%	0.3%	0.1%	0.1%	0.2%	0.3%	0.2%
Food Cans	3.1%	3.1%	2.6%	2.3%	2.1%	1.7%	2.6%	2.4%
Ferrous	0.8%	0.9%	1.4%	0.5%	1.6%	1.0%	1.2%	0.8%
Oil Filters	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>METAL TOTALS</b>	<b>6.1%</b>	<b>9.7%</b>	<b>6.7%</b>	<b>7.3%</b>	<b>5.8%</b>	<b>6.4%</b>	<b>6.2%</b>	<b>7.9%</b>
PET # 1	1.2%	6.4%	1.5%	2.8%	1.4%	2.7%	1.3%	4.0%
HDPE # 2	1.8%	6.6%	1.7%	4.0%	1.6%	4.4%	1.7%	5.1%
Film	3.2%	8.5%	3.2%	9.1%	2.3%	7.9%	2.9%	8.5%
Other Plastic	5.6%	11.2%	6.7%	12.4%	7.1%	13.9%	6.5%	12.4%
<b>PLASTIC TOTALS</b>	<b>11.8%</b>	<b>32.7%</b>	<b>13.1%</b>	<b>28.2%</b>	<b>12.3%</b>	<b>28.8%</b>	<b>12.4%</b>	<b>30.0%</b>
Food Waste	16.8%	6.0%	19.7%	9.2%	17.3%	8.9%	18.0%	8.0%
Wood Waste	0.4%	0.3%	0.3%	0.1%	1.1%	0.7%	0.6%	0.4%
Textiles	3.5%	3.9%	3.8%	3.5%	5.0%	4.3%	4.1%	3.9%
Diapers	5.0%	2.2%	3.6%	1.9%	2.7%	1.7%	3.8%	1.9%
Other Organics	2.6%	1.6%	3.2%	2.1%	9.4%	5.0%	5.0%	2.8%
<b>ORGANIC TOTALS</b>	<b>28.3%</b>	<b>14.0%</b>	<b>30.6%</b>	<b>16.8%</b>	<b>35.5%</b>	<b>20.7%</b>	<b>31.4%</b>	<b>17.0%</b>
Fines	9.4%	4.8%	2.1%	1.8%	1.5%	1.5%	4.3%	2.8%
Other Inorganics	1.7%	0.4%	2.8%	1.3%	0.7%	0.4%	1.8%	0.7%
<b>INORGANIC TOTALS</b>	<b>11.0%</b>	<b>5.2%</b>	<b>4.9%</b>	<b>3.1%</b>	<b>2.2%</b>	<b>1.9%</b>	<b>6.1%</b>	<b>3.5%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 7-8



City of St. Louis Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	372,000
Total Sample Weight (lbs)	7,148.55
Total Number of Samples Collected	40
Significance Test Results	.000
Mean Sample (lbs) and Confidence Interval (95%)	178.71 (+/-) 12.57

City of St. Louis "Other Waste" Summary			
Over-the-Counter Medication (OTC)	12	Beauty/Hygiene Aerosol Products	6
Prescription Medication (Rx)	10	Household Cleaning Aerosol Products	6
Beauty/Hygiene Products	76	Gardening/Yard Care Products	2
Household Cleaning Products	4	Pet Groom Products	1
Sharps/Blades	6	Disposable Razors	27
Syringes	11	Alkaline Batteries	31
Hardware/Shop Products	7	Automobile Maintenance/Cleaning Products	3
Aerosol Cans	4		
Miscellaneous items: 2 disposable lighter, 1 bottle of hair dye.			



## Chapter 8: Macon

### COMMUNITY PROFILE

Much of the solid waste in Northern Missouri is taken to Teter's landfill in Macon, Missouri. This landfill accepts waste from Kirksville, in Adair County (District C); Chariton, Putnam, and Linn Counties (District B), Howard County (District H), and all the counties in the Mark Twain Solid Waste Management District ( District G) Much of the waste sampled at this location originated in Macon County and Adair County.

The principal industry in the area is agri-business. Tourism is important in the Mark Twain lake area and in the City of Hannibal. Kirksville is the home of Northeast Missouri State University and have a strong retail and service sector.

Teeters landfill is located on a county road 3 miles south of highway 36. It is 150 miles northeast of Kansas City, 178 miles northwest of St. Louis, and 221 miles north of Springfield.

#### Demographics:

	<b>Macon County</b>	<b>Adair County</b>
Area (sq. miles)	804	568
Population (1992)	15,030	24,407
Density (per sq. mile)	19	43
Pop. Change since 1980	-7.9%	-1.9%
Number of households	6,160	9060
Persons per household	2.44	2.35
High school graduates	70.3%	74.3%
Median Family Income	\$24,370	\$25,447
Percent below poverty level	24.9%	14.4%



### *Solid waste collection*

Most of the waste sampled was collected by Teeter's sanitation trucks. Kirksville has implemented a volume based pricing system for solid waste and contracts with Teeter Sanitation for waste collection, curbside recycling collection, and disposal. The only other commercial waste hauler the City of Huntsville.

### *Solid waste disposal*

Teeters Landfill receives approximately 120,000 cubic yards (40,000 tons) of waste per year. They do not have a scales on the premise and therefore charge by the cubic yard. The current tipping fee is \$6.50 per cubic yard.

### *Waste reduction and recycling programs*

The area has numerous public and private drop-off sites, and every county has a composting site. There are two curbside programs (Monroe City, and Kirksville). The Mark Twain Solid Waste Management District is studying the feasibility of a material recovery facility and renewable energy/waste recovery facility.

Approximately 360 tons of recyclables are picked up on the curbside routes in Kirksville and Monroe City and taken to NEMO Recycling PPC in Kirksville.

### *Macon Results*

The first sort was scheduled for March 4th through the 7th at Sutton and Son's Landfill in Bowling Green. Heavy rain and muddy conditions forced the cancellation of the sort. Teeter's landfill in Macon was chosen as a location for Sorts # 2 and # 3. Information about sample size and composition are listed in tables 7-1 through 7-8.

**All weights are listed in pounds and all volumes are in cubic feet.**



## **SORT # 2**

### **Sort Conditions**

The remaining two sorts were scheduled at Teter's Landfill in Macon. The second sort was conducted on June 10th through the 12th. The sort facility was set up in a grassy area across from the main administrative building. Weather conditions were misty and overcast.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	67,600
<b>Total Sample Weight (lbs)</b>	2,751
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	3	<b>Beauty/Hygiene Aerosol Products</b>	2
<b>Prescription Medication (Rx)</b>	3	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	12	<b>Gardening/Yard Care Products</b>	1
<b>Household Cleaning Products</b>	2	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	10
<b>Syringes</b>	17	<b>Alkaline Batteries</b>	14
<b>Hardware/Shop Products</b>	3	<b>Automobile Maintenance/Cleaning Products</b>	2
<b>Aerosol Cans</b>	14		
<b>Miscellaneous items:</b> 1 can polyethylene, 1 can isotonic liquid nutrition, 5 medical stitching kits, 1 package moist towlettes.			



# **MACON** **SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	211	47.7	20%	80%	Curbside	Glasgow and Fayette
2	218	52.5	100%	0%	None	Huntsville
3	235	45.8	50%	50%	Curbside	Fayette
4	284.2	45.8	60%	40%	None	Brunswick
5	236.8	54	70%	30%	None	La Plata
6	202	45.7	80%	20%	None	Brookfield and Marceline
7	211	43.5	50%	50%	None	Unionville
8	223	48.6	50%	50%	Curbside/Drop-off	Kirksville
9	276	50.3	60%	40%	Curbside/Drop-off	Kirksville
10	223	44.9	70%	30%	Curbside/Drop-off	Kirksville
11	211	45.2	75%	25%	None	Shelbina
12	220	38.5	80%	20%	None	Shelbina and Macon
<b>TOTALS</b>	<b>2751.0</b>	<b>562.5</b>				
<b>AVERAGE</b>	<b>229.3</b>	<b>46.9</b>	<b>64%</b>	<b>36%</b>		

TABLE 8-1

CATEGORY	MACON				SORT # 2	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	215.5	79.8	18.0	6.7	7.83%	14.15%
Newsprint	185.0	29.1	15.4	2.4	6.73%	5.16%
Magazines	87.0	10.8	7.3	0.9	3.16%	1.91%
High Grade	160.0	26.8	13.3	2.2	5.82%	4.75%
Mixed	466.5	94.5	38.9	7.9	16.96%	16.76%
<b>PAPER TOTALS</b>	<b>1114.0</b>	<b>241.0</b>	<b>92.8</b>	<b>20.1</b>	<b>40.50%</b>	<b>42.73%</b>
Clear	75.0	6.0	6.3	0.5	2.73%	1.06%
Brown	26.0	2.9	2.2	0.2	0.95%	0.51%
Green	9.0	0.9	0.8	0.1	0.33%	0.16%
Other	18.5	1.8	1.5	0.2	0.67%	0.32%
<b>GLASS TOTALS</b>	<b>128.5</b>	<b>11.6</b>	<b>10.7</b>	<b>1.0</b>	<b>4.67%</b>	<b>2.06%</b>
Alum. Cans	42.0	10.2	3.5	0.9	1.53%	1.81%
Other Alum	19.6	3.9	1.6	0.3	0.71%	0.69%
Non ferrous	6.1	0.6	0.5	0.1	0.22%	0.11%
Food Cans	58.0	8.0	4.8	0.7	2.11%	1.42%
Ferrous	28.5	2.7	2.4	0.2	1.04%	0.48%
Oil Filters	1.0	0.1	0.1	0.0	0.04%	0.02%
<b>METAL TOTALS</b>	<b>155.2</b>	<b>25.5</b>	<b>12.9</b>	<b>2.1</b>	<b>5.64%</b>	<b>4.52%</b>
PET # 1	49.5	19.7	4.1	1.6	1.80%	3.49%
HDPE # 2	42.0	17.5	3.5	1.5	1.53%	3.10%
Film	91.0	51.5	7.6	4.3	3.31%	9.13%
Other Plastic	256.0	90.9	21.3	7.6	9.31%	16.12%
<b>PLASTIC TOTALS</b>	<b>438.5</b>	<b>179.6</b>	<b>36.5</b>	<b>15.0</b>	<b>15.94%</b>	<b>31.84%</b>
Food Waste	436.0	41.5	36.3	3.5	15.85%	7.36%
Wood Waste	24.5	3.4	2.0	0.3	0.89%	0.60%
Textiles	210.0	31.9	17.5	2.7	7.63%	5.66%
Diapers	78.2	8.8	6.5	0.7	2.84%	1.56%
Other Organics	71.5	9.4	6.0	0.8	2.60%	1.67%
<b>ORGANIC TOTALS</b>	<b>820.2</b>	<b>95.0</b>	<b>68.4</b>	<b>7.9</b>	<b>29.82%</b>	<b>16.84%</b>
Fines	41.0	6.2	3.4	0.5	1.49%	1.10%
Other Inorganics	53.2	5.1	4.4	0.4	1.93%	0.90%
<b>INORGANIC TOTALS</b>	<b>94.2</b>	<b>11.3</b>	<b>7.9</b>	<b>0.9</b>	<b>3.42%</b>	<b>2.00%</b>
<b>GRAND TOTAL</b>	<b>2750.6</b>	<b>564.0</b>	<b>229.2</b>	<b>47.0</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 8-2





### **SORT # 3**

#### **Sort Conditions**

The third round of sorts (second sort in Macon) was conducted on October 7th through the 8th.

The sort facility was set up in the same location as Sort # 1. Weather conditions were overcast and cool.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	67,600
Total Sample Weight (lbs)	3,035.4
Significance Test Results	.000
Number of Samples	12

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	0	Beauty/Hygiene Aerosol Products	0
Prescription Medication (Rx)	5	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	4	Gardening/Yard Care Products	0
Household Cleaning Products	1	Pet Groom Products	0
Sharps/Blades	1	Disposable Razors	17
Syringes	16	Alkaline Batteries	14
Hardware/Shop Products	0	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	0		
Miscellaneous items: 1 can aluminum paint, 1 container copier toner, 1 package of fireworks, 1 lighter.			



# **MACON SORT #3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	239	52.9	50%	50%	Drop-off	Macon
2	206	59.2	50%	50%	Drop-off	Hanibal and New London
3	208	39	100%	0%	Drop-off	Macon (trailer park)
4	268.5	50.6	100%	0%	Drop-off	Brunswick
5	241.6	47.2	100%	0%	Drop-off	Marceline
6	331.3	71.7	80%	20%	Curbside/drop-off	Monroe
7	303	63.9	70%	30%	Drop-off	La Plata
8	274	53.3	90%	10%	Drop-off	Moberly (southside)
9	303	58	70%	30%	Drop-off	Shelbina and Paris
10	228	45	50%	50%	Curbside/drop-off	Kirksville
11	204	45.7	70%	30%	Curbside/drop-off	Kirksville
12	229	49.7	75%	25%	Curbside/drop-off	Kirksville
<b>TOTALS</b>	<b>3035.4</b>	<b>636.2</b>				
<b>AVERAGE</b>	<b>253.0</b>	<b>53.0</b>	<b>75%</b>	<b>25%</b>		

TABLE 8-3

CATEGORY	MACON				SORT # 3	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	215.0	71.5	17.9	6.0	7.09%	11.24%
Newsprint	149.5	31.2	12.5	2.6	4.93%	4.90%
Magazines	126.0	13.5	10.5	1.1	4.15%	2.12%
High Grade	116.5	20.8	9.7	1.7	3.84%	3.27%
Mixed	434.5	107.7	36.2	9.0	14.32%	16.93%
<b>PAPER TOTALS</b>	<b>1041.5</b>	<b>244.7</b>	<b>86.8</b>	<b>20.4</b>	<b>34.32%</b>	<b>38.46%</b>
Clear	75.5	7.3	6.3	0.6	2.49%	1.15%
Brown	46.5	4.0	3.9	0.3	1.53%	0.63%
Green	16.0	1.8	1.3	0.2	0.53%	0.28%
Other	31.0	3.4	2.6	0.3	1.02%	0.53%
<b>GLASS TOTALS</b>	<b>169.0</b>	<b>16.5</b>	<b>14.1</b>	<b>1.4</b>	<b>5.57%</b>	<b>2.59%</b>
Alum. Cans	54.5	22.6	4.5	1.9	1.80%	3.55%
Other Alum	28.6	6.0	2.4	0.5	0.94%	0.94%
Non ferrous	10.1	2.0	0.8	0.2	0.33%	0.31%
Food Cans	118.0	20.9	9.8	1.7	3.89%	3.29%
Ferrous	37.0	3.3	3.1	0.3	1.22%	0.52%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>248.2</b>	<b>54.8</b>	<b>20.7</b>	<b>4.6</b>	<b>8.18%</b>	<b>8.61%</b>
PET # 1	56.5	26.4	4.7	2.2	1.86%	4.15%
HDPE # 2	68.5	30.8	5.7	2.6	2.26%	4.84%
Film	86.0	44.5	7.2	3.7	2.83%	6.99%
Other Plastic	226.2	83.7	18.9	7.0	7.45%	13.16%
<b>PLASTIC TOTALS</b>	<b>437.2</b>	<b>185.4</b>	<b>36.4</b>	<b>15.5</b>	<b>14.41%</b>	<b>29.14%</b>
Food Waste	602.5	55.2	50.2	4.6	19.86%	8.68%
Wood Waste	27.6	3.1	2.3	0.3	0.91%	0.49%
Textiles	113.5	20.2	9.5	1.7	3.74%	3.18%
Diapers	213.0	26.7	17.8	2.2	7.02%	4.20%
Other Organics	97.3	17.6	8.1	1.5	3.21%	2.77%
<b>ORGANIC TOTALS</b>	<b>1053.9</b>	<b>122.8</b>	<b>87.8</b>	<b>10.2</b>	<b>34.73%</b>	<b>19.30%</b>
Fines	58.0	8.5	4.8	0.7	1.91%	1.34%
Other Inorganics	26.5	3.5	2.2	0.3	0.87%	0.55%
<b>INORGANIC TOTALS</b>	<b>84.5</b>	<b>12.0</b>	<b>7.0</b>	<b>1.0</b>	<b>2.78%</b>	<b>1.89%</b>
<b>GRAND TOTAL</b>	<b>3034.3</b>	<b>636.2</b>	<b>252.9</b>	<b>53.0</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 8-4



## **SORT SUMMARY**

### **Seasonal variations**

- Paper totals were higher in the second sort. No obvious cause.
- Disposable diapers were considerably higher in the third sort due to a large amount of adult diapers in a sample from a nursing home.
- Textiles were considerably higher in the second round. No obvious cause.

### **Sort results**

- Chart 8-1 graphically compares the three seasonal waste sort results and shows the average waste composition, by major category, for Macon.
- The sample data for all Macon sorts is listed on table 8-5.
- The sort results for all Macon sorts are listed on table 8-6.
- The summary of statistical relevance for the Macon sorts is located on page 122.
- The total for all “other wastes” found during the Macon sorts is on page 122.

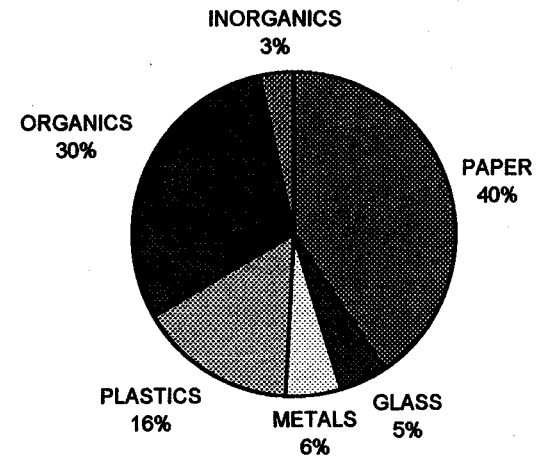
**All weights are in pounds and volumes are listed in cubic feet.**

Comparisons of the Macon waste stream to previous studies and other communities can be found in chapter 13.

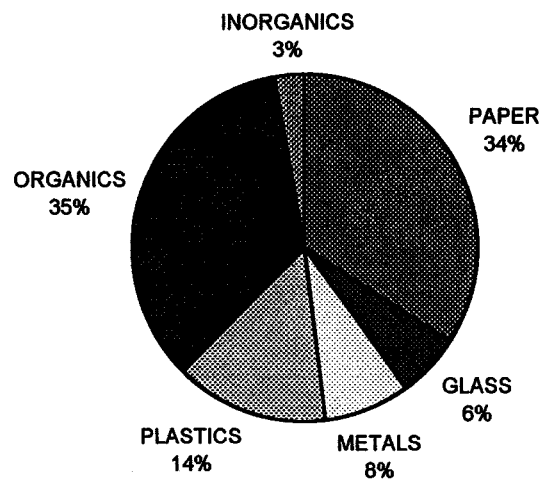
## MACON RESULTS BY WEIGHT

**SORT #1 WAS  
CANCELLED  
DUE TO HEAVY  
RAIN AND ICE**

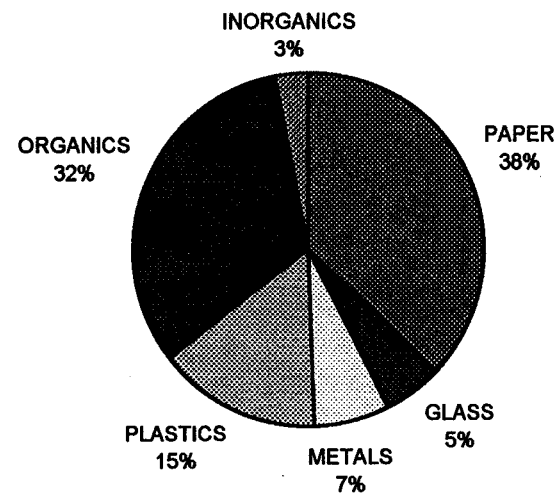
**SORT #2**



**SORT #3**



**SORT AVERAGE**





# **MACON SAMPLE SUMMARY**

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	3/4-3/6	0	CANCELLED SORT DUE TO HEAVY RAIN			
2	6/10-6-12	12	2751.0	562.5	64%	36%
3	10/7-10/8	12	3035.4	636.2	75%	25%
<b>TOTALS</b>		<b>24.0</b>	<b>5786.4</b>	<b>1198.7</b>		
<b>AVERAGE</b>		<b>12.0</b>	<b>2893.2</b>	<b>599.4</b>	<b>70%</b>	<b>30%</b>

TABLE 8-5

CATEGORY	MACON						SUMMARY	
	SORT # 1		SORT # 2		SORT # 3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	N/A	N/A	7.8%	14.1%	7.1%	11.2%	7.4%	12.6%
Newsprint	N/A	N/A	6.7%	5.2%	4.9%	4.9%	5.8%	5.0%
Magazines	N/A	N/A	3.2%	1.9%	4.2%	2.1%	3.7%	2.0%
High Grade	N/A	N/A	5.8%	4.8%	3.8%	3.3%	4.8%	4.0%
Mixed	N/A	N/A	17.0%	16.8%	14.3%	16.9%	15.6%	16.8%
<b>PAPER TOTALS</b>	<b>N/A</b>	<b>N/A</b>	<b>40.5%</b>	<b>42.7%</b>	<b>34.3%</b>	<b>38.5%</b>	<b>37.3%</b>	<b>40.5%</b>
Clear	N/A	N/A	2.7%	1.1%	2.5%	1.1%	2.6%	1.1%
Brown	N/A	N/A	0.9%	0.5%	1.5%	0.6%	1.3%	0.6%
Green	N/A	N/A	0.3%	0.2%	0.5%	0.3%	0.4%	0.2%
Other	N/A	N/A	0.7%	0.3%	1.0%	0.5%	0.9%	0.4%
<b>GLASS TOTALS</b>	<b>N/A</b>	<b>N/A</b>	<b>4.7%</b>	<b>2.1%</b>	<b>5.6%</b>	<b>2.6%</b>	<b>5.1%</b>	<b>2.3%</b>
Alum. Cans	N/A	N/A	1.5%	1.8%	1.8%	3.6%	1.7%	2.7%
Other Alum	N/A	N/A	0.7%	0.7%	0.9%	0.9%	0.8%	0.8%
Non ferrous	N/A	N/A	0.2%	0.1%	0.3%	0.3%	0.3%	0.2%
Food Cans	N/A	N/A	2.1%	1.4%	3.9%	3.3%	3.0%	2.4%
Ferrous	N/A	N/A	1.0%	0.5%	1.2%	0.5%	1.1%	0.5%
Oil Filters	N/A	N/A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>METAL TOTALS</b>	<b>N/A</b>	<b>N/A</b>	<b>5.6%</b>	<b>4.5%</b>	<b>8.2%</b>	<b>8.6%</b>	<b>7.0%</b>	<b>6.7%</b>
PET # 1	N/A	N/A	1.8%	3.5%	1.9%	4.1%	1.8%	3.8%
HDPE # 2	N/A	N/A	1.5%	3.1%	2.3%	4.8%	1.9%	4.0%
Film	N/A	N/A	3.3%	9.1%	2.8%	7.0%	3.1%	8.0%
Other Plastic	N/A	N/A	9.3%	16.1%	7.5%	13.2%	8.3%	14.5%
<b>PLASTIC TOTALS</b>	<b>N/A</b>	<b>N/A</b>	<b>15.9%</b>	<b>31.8%</b>	<b>14.4%</b>	<b>29.1%</b>	<b>15.1%</b>	<b>30.4%</b>
Food Waste	N/A	N/A	15.9%	7.4%	19.9%	8.7%	18.0%	8.1%
Wood Waste	N/A	N/A	0.9%	0.6%	0.9%	0.5%	0.9%	0.5%
Textiles	N/A	N/A	7.6%	5.7%	3.7%	3.2%	5.6%	4.3%
Diapers	N/A	N/A	2.8%	1.6%	7.0%	4.2%	5.0%	3.0%
Other Organics	N/A	N/A	2.6%	1.7%	3.2%	2.8%	2.9%	2.2%
<b>ORGANIC TOTALS</b>	<b>N/A</b>	<b>N/A</b>	<b>29.8%</b>	<b>16.8%</b>	<b>34.7%</b>	<b>19.3%</b>	<b>32.4%</b>	<b>18.1%</b>
Fines	N/A	N/A	1.5%	1.1%	1.9%	1.3%	1.7%	1.2%
Other Inorganics	N/A	N/A	1.9%	0.9%	0.9%	0.6%	1.4%	0.7%
<b>INORGANIC TOTALS</b>	<b>N/A</b>	<b>N/A</b>	<b>3.4%</b>	<b>2.0%</b>	<b>2.8%</b>	<b>1.9%</b>	<b>3.1%</b>	<b>1.9%</b>
<b>SORT TOTALS</b>	<b>N/A</b>	<b>N/A</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 8-6



<b>Macon Statistical Summary</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	67,600
<b>Total Sample Weight (lbs)</b>	5,786.4
<b>Total Number of Samples Collected</b>	24
<b>Significance Test Results</b>	.000
<b>Mean Sample (lbs) and Confidence Interval (95%)</b>	241.10 (+/-) 15.5

<b>Macon "Other Waste" Summary</b>			
<b>Over-the-Counter Medication (OTC)</b>	3	<b>Beauty/Hygiene Aerosol Products</b>	2
<b>Prescription Medication (Rx)</b>	8	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	16	<b>Gardening/Yard Care Products</b>	1
<b>Household Cleaning Products</b>	3	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	1	<b>Disposable Razors</b>	27
<b>Syringes</b>	33	<b>Alkaline Batteries</b>	28
<b>Hardware/Shop Products</b>	3	<b>Automobile Maintenance/Cleaning Products</b>	2
<b>Aerosol Cans</b>	14		
<b>Miscellaneous items:</b> 1 can polyethylene, 1 can isotonic liquid nutrition, 5 medical stitching bags, 1 package moist towlettes, 1 can of aluminum paint, 1 container copier toner, 1 package of fireworks, 1 lighter.			



## Chapter 9: Maryville

### COMMUNITY PROFILE

The City of Maryville is located in the Northwest corner of Missouri and is the county seat for Nodaway County. Maryville is a member of Northwest Missouri Solid Waste Management District (District A). A majority (89%) of the waste samples examined during all three sorts were generated in the city of Maryville.

Maryville is the largest city in the county with a population of 10,709, and is the home of Northwest Missouri State University. Agri-business, university related retail and service businesses, and two large manufacturers (Kawasaki and Eveready) are the primary industries.

Maryville is located on highway 71. It is 95 miles north of Kansas City, 348 miles northwest of St. Louis, and 260 miles north of Springfield

#### Demographics:

	<b>Maryville</b>	<b>Nodaway County</b>
Area (sq. miles)	4.4	77
Population (1992)	10,663	21,236
Density (per sq. mile)	2423	24
Pop. Change since 1980	11.6%	-3.5%
Number of households	3545	7620
Persons per household	2.3	2.48
High school graduates	83.3%	80.7%
Median Family Income	\$27,829	\$26,437
Percent below poverty level	26.9%	21.8%



### **Solid waste collection**

Solid waste is collected by several private waste haulers in the Maryville area. The city licenses the haulers but does not franchise or set up collection zones. All waste haulers are required to offer curbside recycling to their customers.

### **Solid waste disposal**

The City of Maryville owns and operates the landfill which is located two miles north of the city on highway 71. The landfill accepts waste from Maryville and the surrounding counties. The current tipping fee for solid waste is \$56 per ton. This is the highest tipping fee in Missouri. No tipping fee is charged for Recyclable material. The landfill receives approximately 12,000 tons of solid waste per year.

### **Waste reduction and recycling programs**

The City of Maryville has one of Missouri's most aggressive recycling programs. The Regional Recycling Center (RRC) was built by the City of Maryville and accepts paper, glass, plastic containers, aluminum containers, and steel cans. The RRC supplies paper to the university who pelletizes the paper and uses it for fuel. The RRC processes approximately 7500 tons of material per year. In addition there are several small recycling operations in the District. These include, William's Recycling, David Recycling, and two opportunity workshops.

The City of Maryville also operates a yard waste composting facility at the landfill.

### **Maryville Results**

Information about sample size and composition are listed in tables 9-1 through 9-8

**All weights are listed in pounds and all volumes are in cubic feet.**



## **SORT # 1**

### **Sort Conditions**

The first sort was conducted March 18th through the 22nd. The sort facility was set up in the landfill just above the unloading area. Weather conditions were harsh, including cold, wind, and snow flurries. The third day was shortened due to these extreme weather conditions.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	100,000
Total Sample Weight (lbs)	2,839.4
Significance Test Results	.000
Number of Samples	14

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	1	Beauty/Hygiene Aerosol Products	5
Prescription Medication (Rx)	11	Household Cleaning Aerosol Products	2
Beauty/Hygiene Products	18	Gardening/Yard Care Products	1
Household Cleaning Products	4	Pet Groom Products	2
Sharps/Blades	2	Disposable Razors	25
Syringes	180	Alkaline Batteries	67
Hardware/Shop Products	1	Automobile Maintenance/Cleaning Products	4
Aerosol Cans	3		
Miscellaneous items: 1 jar of silver cleaner, 1 package of fireworks,			
1 fluorescent tube, 1 nebulizer, 13 partial bottles of perm solution,			
1 oxygen mask.			



# MARYVILLE

## SORT #1

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	122	35.6	100%	0%	Curb side/drop off	Maryville
2	102	29.1	100%	0%	Curb side/drop off	Maryville
3	188	41.8	90%	10%	Curb side/drop off	Maryville
4	230	55	100%	0%	Curb side/drop off	Maryville
5	182	57.6	90%	10%	Curb side/drop off	Maryville
6	195.9	39	100%	0%	Curb side/drop off	Maryville
7	185	54	75%	25%	Curb side/drop off	Maryville
8	209	76	100%	0%	Curb side/drop off	Ravenwood
9	254	58	100%	0%	Curb side/drop off	Maryville
10	244	80.3	100%	0%	Curb side/drop off	Maryville
11	231	54.5	100%	0%	Curb side/drop off	East of Maryville
12	263.5	88.5	100%	0%	Curb side/drop off	Maryville
13	222	65.2	100%	0%	Curb side/drop off	Maryville
14	211	67.4	100%	0%	Curb side/drop off	Maryville
<b>TOTALS</b>	<b>2839.4</b>	<b>802.0</b>				
<b>AVERAGE</b>	<b>202.8</b>	<b>57.3</b>	<b>96%</b>	<b>4%</b>		

TABLE 9-1

**MARYVILLE****SORT # 1**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	92.2	64.0	6.6	4.6	3.25%	7.98%
Newsprint	110.5	36.0	7.9	2.6	3.89%	4.49%
Magazines	44.0	9.8	3.1	0.7	1.55%	1.22%
High Grade	32.0	16.0	2.3	1.1	1.13%	2.00%
Mixed	516.1	186.0	36.9	13.3	18.19%	23.20%
<b>PAPER TOTALS</b>	<b>794.8</b>	<b>311.8</b>	<b>56.8</b>	<b>22.3</b>	<b>28.01%</b>	<b>38.89%</b>
Clear	51.5	6.8	3.7	0.5	1.82%	0.84%
Brown	43.2	4.8	3.1	0.3	1.52%	0.60%
Green	3.5	0.5	0.3	0.0	0.12%	0.06%
Other	19.8	5.3	1.4	0.4	0.70%	0.66%
<b>GLASS TOTALS</b>	<b>118.0</b>	<b>17.3</b>	<b>8.4</b>	<b>1.2</b>	<b>4.16%</b>	<b>2.16%</b>
Alum. Cans	13.6	7.2	1.0	0.5	0.48%	0.90%
Other Alum	25.0	13.8	1.8	1.0	0.88%	1.71%
Non ferrous	10.3	1.8	0.7	0.1	0.36%	0.22%
Food Cans	28.8	8.2	2.1	0.6	1.01%	1.02%
Ferrous	44.2	9.9	3.2	0.7	1.56%	1.23%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>121.8</b>	<b>40.9</b>	<b>8.7</b>	<b>2.9</b>	<b>4.29%</b>	<b>5.10%</b>
PET # 1	19.5	15.3	1.4	1.1	0.69%	1.91%
HDPE # 2	34.0	25.4	2.4	1.8	1.20%	3.17%
Film	90.5	64.0	6.5	4.6	3.19%	7.98%
Other Plastic	234.3	134.8	16.7	9.6	8.26%	16.81%
<b>PLASTIC TOTALS</b>	<b>378.3</b>	<b>239.5</b>	<b>27.0</b>	<b>17.1</b>	<b>13.33%</b>	<b>29.87%</b>
Food Waste	723.0	59.5	51.6	4.3	25.48%	7.42%
Wood Waste	16.4	4.5	1.2	0.3	0.58%	0.56%
Textiles	62.5	23.4	4.5	1.7	2.20%	2.92%
Diapers	186.2	35.7	13.3	2.5	6.56%	4.45%
Other Organics	138.5	26.5	9.9	1.9	4.88%	3.31%
<b>ORGANIC TOTALS</b>	<b>1126.6</b>	<b>149.6</b>	<b>80.5</b>	<b>10.7</b>	<b>39.71%</b>	<b>18.65%</b>
Fines	196.0	30.0	14.0	2.1	6.91%	3.74%
Other Inorganics	102.0	12.8	7.3	0.9	3.59%	1.60%
<b>INORGANIC TOTALS</b>	<b>298.0</b>	<b>42.8</b>	<b>21.3</b>	<b>3.1</b>	<b>10.50%</b>	<b>5.34%</b>
<b>GRAND TOTAL</b>	<b>2837.3</b>	<b>801.8</b>	<b>202.7</b>	<b>57.3</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 9-2







## **SORT # 2**

### **Sort Conditions**

The second sort was conducted June 24th through the 26th. The sort facility was set up on a grassy area close to the entrance of the landfill. Samples were transported to and from the sort facility by trailer. Weather conditions were sunny and very warm.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	100,000
<b>Total Sample Weight (lbs)</b>	2,816.7
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>over-the-counter Medication (OTC)</b>	21	<b>Beauty/Hygiene Aerosol Products</b>	5
<b>Prescription Medication (Rx)</b>	25	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	22	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	1	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	3	<b>Disposable Razors</b>	21
<b>Syringes</b>	11	<b>Alkaline Batteries</b>	34
<b>Hardware/Shop Products</b>	2	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	1		
<b>Miscellaneous items:</b> 2 bullets, 1 thermometer, 2 packages of firecrackers, 1 lighter.			



**MARYVILLE**  
**SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	210	46.5	100%	0%	Curbside/ Drop-off	Maryville
2	298	67.4	100%	0%	Curbside/ Drop-off	Maryville
3	215	51.9	100%	0%	Curbside/ Drop-off	Maryville
4	165	41	100%	0%	Curbside/ Drop-off	Maryville
5	232.5	39.1	100%	0%	Curbside/ Drop-off	Maryville
6	173.2	47.1	100%	0%	Curbside/ Drop-off	Maryville
7	275	60	100%	0%	Curbside/ Drop-off	Maryville
8	234	42.4	100%	0%	Curbside/ Drop-off	Maryville
9	216	46.9	100%	0%	Curbside/ Drop-off	Maryville
10	297	63.6	100%	0%	Curbside/ Drop-off	Maryville
11	267	88.6	100%	0%	Curbside/ Drop-off	Maryville
12	234	51.7	100%	0%	Curbside/ Drop-off	Maryville
<b>TOTALS</b>	<b>2816.7</b>	<b>646.2</b>				
<b>AVERAGE</b>	<b>234.7</b>	<b>53.9</b>	<b>100%</b>	<b>0%</b>		

TABLE 9-3

CATEGORY	MARYVILLE				SORT # 2	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	153.5	73.0	12.8	6.1	5.45%	11.30%
Newsprint	68.0	12.1	5.7	1.0	2.41%	1.87%
Magazines	41.5	3.4	3.5	0.3	1.47%	0.53%
High Grade	34.2	5.7	2.9	0.5	1.21%	0.88%
Mixed	491.5	129.5	41.0	10.8	17.45%	20.04%
<b>PAPER TOTALS</b>	<b>788.7</b>	<b>223.7</b>	<b>65.7</b>	<b>18.6</b>	<b>28.00%</b>	<b>34.62%</b>
Clear	25.5	2.3	2.1	0.2	0.91%	0.36%
Brown	19.0	1.8	1.6	0.2	0.67%	0.28%
Green	3.0	0.2	0.3	0.0	0.11%	0.03%
Other	32.5	3.0	2.7	0.3	1.15%	0.46%
<b>GLASS TOTALS</b>	<b>80.0</b>	<b>7.3</b>	<b>6.7</b>	<b>0.6</b>	<b>2.84%</b>	<b>1.13%</b>
Alum. Cans	12.0	2.2	1.0	0.2	0.43%	0.34%
Other Alum	28.0	5.3	2.3	0.4	0.99%	0.81%
Non ferrous	5.0	0.5	0.4	0.0	0.18%	0.08%
Food Cans	44.5	8.6	3.7	0.7	1.58%	1.33%
Ferrous	39.5	7.0	3.3	0.6	1.40%	1.08%
Oil Filters	7.0	0.6	0.6	0.1	0.25%	0.09%
<b>METAL TOTALS</b>	<b>136.0</b>	<b>24.2</b>	<b>11.3</b>	<b>2.0</b>	<b>4.83%</b>	<b>3.74%</b>
PET # 1	21.0	9.3	1.8	0.8	0.75%	1.44%
HDPE # 2	36.5	18.3	3.0	1.5	1.30%	2.83%
Film	105.0	58.0	8.8	4.8	3.73%	8.98%
Other Plastic	235.0	106.5	19.6	8.9	8.34%	16.48%
<b>PLASTIC TOTALS</b>	<b>397.5</b>	<b>192.1</b>	<b>33.1</b>	<b>16.0</b>	<b>14.11%</b>	<b>29.73%</b>
Food Waste	764.5	90.5	63.7	7.5	27.14%	14.01%
Wood Waste	24.0	3.7	2.0	0.3	0.85%	0.57%
Textiles	127.0	27.1	10.6	2.3	4.51%	4.19%
Diapers	221.0	26.7	18.4	2.2	7.84%	4.13%
Other Organics	145.0	32.9	12.1	2.7	5.15%	5.09%
<b>ORGANIC TOTALS</b>	<b>1281.5</b>	<b>180.9</b>	<b>106.8</b>	<b>15.1</b>	<b>45.49%</b>	<b>28.00%</b>
Fines	89.5	14.7	7.5	1.2	3.18%	2.28%
Other Inorganics	44.0	3.3	3.7	0.3	1.56%	0.51%
<b>INORGANIC TOTALS</b>	<b>133.5</b>	<b>18.0</b>	<b>11.1</b>	<b>1.5</b>	<b>4.74%</b>	<b>2.79%</b>
<b>GRAND TOTAL</b>	<b>2817.2</b>	<b>646.2</b>	<b>234.8</b>	<b>53.8</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 9-4





### **SORT # 3**

#### **Sort Conditions**

The third sort was conducted on October 21 through the 23. The sort facility was set up just inside the entrance to the landfill. Weather conditions included high winds, and eight inches of wet snow. The sort was cut short due to the extreme weather conditions which made collecting samples very difficult.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	100,000
<b>Total Sample Weight (lbs)</b>	2,366.1
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	8

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	1	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	1	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	5	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	1	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	1	<b>Disposable Razors</b>	6
<b>Syringes</b>	5	<b>Alkaline Batteries</b>	5
<b>Hardware/Shop Products</b>	1	<b>Automobile Maintenance/Cleaning Products</b>	3
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items: None.</b>			



**MARYVILLE**  
**SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	210	55.2	90%	10%	Curbside/Drop-off	Maryville vicinity (rural)
2	222	63.1	90%	10%	Curbside/Drop-off	Cargill (rural)
3	233	49.3	100%	0%	Curbside/Drop-off	Maryville
4	189.5	43.4	100%	0%	Curbside/Drop-off	Maryville
5	270	65	100%	0%	Curbside/Drop-off	Maryville
6	241.5	50.4	100%	0%	Curbside/Drop-off	Maryville
7	144	41.3	100%	0%	Curbside/Drop-off	Maryville
8	202	38.2	100%	0%	Curbside/Drop-off	Maryville
<b>TOTALS</b>	<b>1712</b>	<b>405.9</b>				
<b>AVERAGE</b>	<b>214</b>	<b>50.7</b>	<b>97%</b>	<b>3%</b>		

TABLE 9-5

CATEGORY	MARYVILLE				SORT # 3	
	TOTALS		AVERAGE		Pct. by wt.	Pct. by vol.
	wt.	vol.	wt.	vol.		
Cardboard	89.5	44.0	11.2	5.5	5.23%	10.84%
Newsprint	77.5	15.8	9.7	2.0	4.53%	3.89%
Magazines	39.1	4.6	4.9	0.6	2.29%	1.13%
High Grade	37.5	11.1	4.7	1.4	2.19%	2.72%
Mixed	268.8	82.2	33.6	10.3	15.71%	20.25%
<b>PAPER TOTALS</b>	<b>512.4</b>	<b>157.7</b>	<b>64.0</b>	<b>19.7</b>	<b>29.96%</b>	<b>38.84%</b>
Clear	43.5	3.4	5.4	0.4	2.54%	0.84%
Brown	26.2	2.7	3.3	0.3	1.53%	0.67%
Green	8.0	0.8	1.0	0.1	0.47%	0.20%
Other	15.0	1.2	1.9	0.2	0.88%	0.30%
<b>GLASS TOTALS</b>	<b>92.7</b>	<b>8.1</b>	<b>11.6</b>	<b>1.0</b>	<b>5.42%</b>	<b>2.00%</b>
Alum. Cans	21.5	6.6	2.7	0.8	1.26%	1.63%
Other Alum	27.0	10.5	3.4	1.3	1.58%	2.59%
Non ferrous	10.0	0.6	1.3	0.1	0.58%	0.15%
Food Cans	45.7	9.3	5.7	1.2	2.67%	2.29%
Ferrous	17.5	2.4	2.2	0.3	1.02%	0.59%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>121.7</b>	<b>29.4</b>	<b>15.2</b>	<b>3.7</b>	<b>7.12%</b>	<b>7.24%</b>
PET # 1	23.5	8.1	2.9	1.0	1.37%	2.00%
HDPE # 2	21.7	8.4	2.7	1.1	1.27%	2.07%
Film	56.0	36.0	7.0	4.5	3.27%	8.87%
Other Plastic	148.0	74.0	18.5	9.3	8.65%	18.23%
<b>PLASTIC TOTALS</b>	<b>249.2</b>	<b>126.5</b>	<b>31.2</b>	<b>15.8</b>	<b>14.57%</b>	<b>31.17%</b>
Food Waste	386.5	31.0	48.3	3.9	22.60%	7.64%
Wood Waste	28.0	2.9	3.5	0.4	1.64%	0.71%
Textiles	56.5	17.7	7.1	2.2	3.30%	4.36%
Diapers	79.5	9.2	9.9	1.2	4.65%	2.27%
Other Organics	63.5	13.4	7.9	1.7	3.71%	3.30%
<b>ORGANIC TOTALS</b>	<b>614.0</b>	<b>74.2</b>	<b>76.8</b>	<b>9.3</b>	<b>35.90%</b>	<b>18.28%</b>
Fines	43.0	5.6	5.4	0.7	2.51%	1.38%
Other Inorganics	77.2	4.4	9.7	0.6	4.51%	1.08%
<b>INORGANIC TOTALS</b>	<b>120.2</b>	<b>10.0</b>	<b>15.0</b>	<b>1.3</b>	<b>7.03%</b>	<b>2.46%</b>
<b>GRAND TOTAL</b>	<b>1710.2</b>	<b>405.9</b>	<b>213.8</b>	<b>50.7</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 9-6



## **SORT SUMMARY**

### **Seasonal variations**

- Clear and brown glass containers were lower during the second sort. The University was in summer session which resulted in less students (presumably consuming beer) in the area.
- Aluminum cans were higher during the third sort. Homecoming weekend was prior to the sort and several bags of “party trash” were sorted.
- Food waste was higher during the second sort due to watermelon rinds and corn shucks.
- Disposable diaper were higher during the first and second sort. During each of these sorts several bags of nursing home waste was sorted with large amounts of adult diapers.
- Fines were higher during the first sort. Modification in the sorting procedure caused more of the fines to be sorted into the appropriate categories in the second and third round.

### **Sort results**

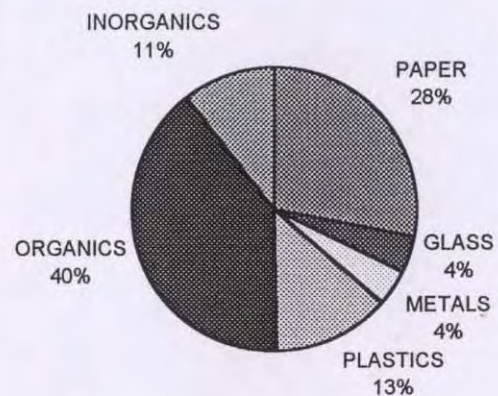
- Chart 9-1 graphically compares the three seasonal waste sort results and shows the average waste composition, by major category, for Maryville.
- The sample data for all Maryville sorts is listed on table 9-7.
- The sort results for all Maryville sorts are listed on table 9-8.
- The summary of statistical relevance for the Maryville sorts is located on page 140.
- The total for all “other wastes” found during the Maryville sorts is on page 140.

**All weights are in pounds and volumes are listed in cubic feet.**

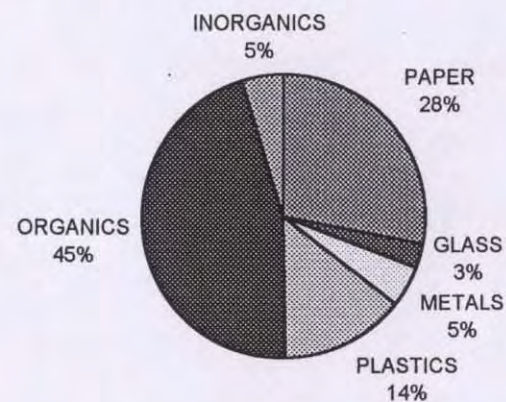
Comparisons of the Maryville waste stream to previous studies and other communities can be found in chapter 13.

## MARYVILLE RESULTS BY WEIGHT

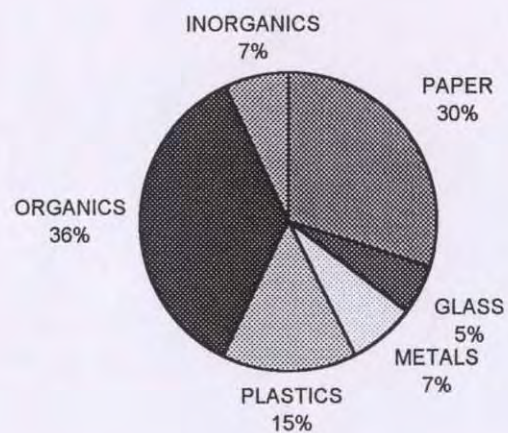
**SORT #1**



**SORT #2**



**SORT #3**



**SORT AVERAGE**

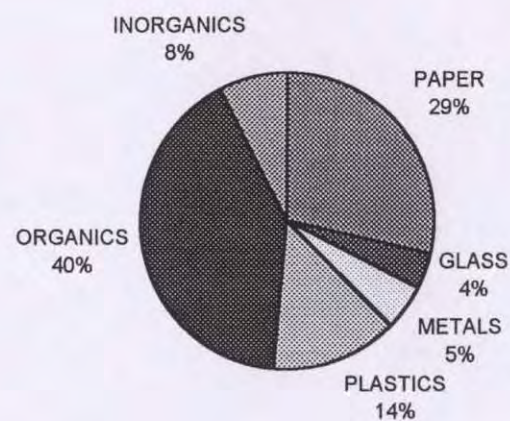


CHART 9-1



# **MARYVILLE SAMPLE SUMMARY**

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	3/18-3/21	14	2839.4	802.0	96%	4%
2	6/24-6-26	12	2816.7	646.2	100%	0%
3	10/21-10/23	8	1712.0	405.9	97%	3%
<b>TOTALS</b>		<b>34.0</b>	<b>7368.1</b>	<b>1854.1</b>		
<b>AVERAGE</b>		<b>11.3</b>	<b>2456.0</b>	<b>618.0</b>	<b>98%</b>	<b>2%</b>

TABLE 9-7

CATEGORY	MARYVILLE						SUMMARY	
	SORT # 1		SORT # 2		SORT # 3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	3.2%	8.0%	5.4%	11.3%	5.2%	10.8%	4.6%	9.8%
Newsprint	3.9%	4.5%	2.4%	1.9%	4.5%	3.9%	3.5%	3.4%
Magazines	1.6%	1.2%	1.5%	0.5%	2.3%	1.1%	1.7%	1.0%
High Grade	1.1%	2.0%	1.2%	0.9%	2.2%	2.7%	1.4%	1.8%
Mixed	18.2%	23.2%	17.4%	20.0%	15.7%	20.3%	17.3%	21.4%
<b>PAPER TOTALS</b>	<b>28.0%</b>	<b>38.9%</b>	<b>28.0%</b>	<b>34.6%</b>	<b>30.0%</b>	<b>38.9%</b>	<b>28.5%</b>	<b>37.4%</b>
Clear	1.8%	0.8%	0.9%	0.4%	2.5%	0.8%	1.6%	0.7%
Brown	1.5%	0.6%	0.7%	0.3%	1.5%	0.7%	1.2%	0.5%
Green	0.1%	0.1%	0.1%	0.0%	0.5%	0.2%	0.2%	0.1%
Other	0.7%	0.7%	1.2%	0.5%	0.9%	0.3%	0.9%	0.5%
<b>GLASS TOTALS</b>	<b>4.2%</b>	<b>2.2%</b>	<b>2.8%</b>	<b>1.1%</b>	<b>5.4%</b>	<b>2.0%</b>	<b>3.9%</b>	<b>1.8%</b>
Alum. Cans	0.5%	0.9%	0.4%	0.3%	1.3%	1.6%	0.6%	0.9%
Other Alum	0.9%	1.7%	1.0%	0.8%	1.6%	2.6%	1.1%	1.6%
Non ferrous	0.4%	0.2%	0.2%	0.1%	0.6%	0.1%	0.3%	0.2%
Food Cans	1.0%	1.0%	1.6%	1.3%	2.7%	2.3%	1.6%	1.4%
Ferrous	1.6%	1.2%	1.4%	1.1%	1.0%	0.6%	1.4%	1.0%
Oil Filters	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.1%	0.0%
<b>METAL TOTALS</b>	<b>4.3%</b>	<b>5.1%</b>	<b>4.8%</b>	<b>3.7%</b>	<b>7.1%</b>	<b>7.2%</b>	<b>5.2%</b>	<b>5.1%</b>
PET # 1	0.7%	1.9%	0.7%	1.4%	1.4%	2.0%	0.9%	1.8%
HDPE # 2	1.2%	3.2%	1.3%	2.8%	1.3%	2.1%	1.3%	2.8%
Film	3.2%	8.0%	3.7%	9.0%	3.3%	8.9%	3.4%	8.5%
Other Plastic	8.3%	16.8%	8.3%	16.5%	8.7%	18.2%	8.4%	17.0%
<b>PLASTIC TOTALS</b>	<b>13.3%</b>	<b>29.9%</b>	<b>14.1%</b>	<b>29.7%</b>	<b>14.6%</b>	<b>31.2%</b>	<b>13.9%</b>	<b>30.1%</b>
Food Waste	25.5%	7.4%	27.1%	14.0%	22.6%	7.6%	25.4%	9.8%
Wood Waste	0.6%	0.6%	0.9%	0.6%	1.6%	0.7%	0.9%	0.6%
Textiles	2.2%	2.9%	4.5%	4.2%	3.3%	4.4%	3.3%	3.7%
Diapers	6.6%	4.5%	7.8%	4.1%	4.6%	2.3%	6.6%	3.9%
Other Organics	4.9%	3.3%	5.1%	5.1%	3.7%	3.3%	4.7%	3.9%
<b>ORGANIC TOTALS</b>	<b>39.7%</b>	<b>18.7%</b>	<b>45.5%</b>	<b>28.0%</b>	<b>35.9%</b>	<b>18.3%</b>	<b>41.0%</b>	<b>21.8%</b>
Fines	6.9%	3.7%	3.2%	2.3%	2.5%	1.4%	4.5%	2.7%
Other Inorganics	3.6%	1.6%	1.6%	0.5%	4.5%	1.1%	3.0%	1.1%
<b>INORGANIC TOTALS</b>	<b>10.5%</b>	<b>5.3%</b>	<b>4.7%</b>	<b>2.8%</b>	<b>7.0%</b>	<b>2.5%</b>	<b>7.5%</b>	<b>3.8%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 9-8



City of Maryville Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	100,000
Total Sample Weight (lbs)	7,386.1
Total Number of Samples Collected	33
Significance Test Results	.000
Mean Sample (lbs) and Confidence Interval (95%)	216.72 (+/-) 15.47

City of Maryville "Other Waste" Summary			
Over-the-Counter Medication (OTC)	23	Beauty/Hygiene Aerosol Products	10
Prescription Medication (Rx)	37	Household Cleaning Aerosol Products	2
Beauty/Hygiene Products	45	Gardening/Yard Care Products	1
Household Cleaning Products	5	Pet Groom Products	2
Sharps/Blades	6	Disposable Razors	52
Syringes	196	Alkaline Batteries	106
Hardware/Shop Products	4	Automobile Maintenance/Cleaning Products	7
Aerosol Cans	4		
<b>Miscellaneous items:</b> 1 jar silver cleaner, 3 package of fireworks, 1 fluorescent tube, 1 nebulizer, 13 partial bottles of perm solution, 1 oxygen mask, 2 bullets, 1 thermometer, 1 lighter.			



## Chapter 10: Lee's Summit

### COMMUNITY PROFILE

The City of Lee's Summit is in Jackson County and is part of the Kansas City Metropolitan area.

Lee's Summit was the most prosperous, best educated, and fastest growing community examined during phase I of the study. Lee Summit has a strong industrial base and is the home of many service and retail businesses. The City is a member of the Mid-America Regional Council Solid Waste Management District (District E).

Lee's Summit is 15 miles southeast of downtown Kansas City, 160 miles north of Springfield and 250 miles west of St. Louis.

#### Demographics:

	Lee's Summit	Jackson County
Area (sq. miles)	59.1	605
Population (1992)	51,327	634,057
Density (per sq. mile)	868	19
Pop. Change since 1980	78.6%	13.1%
Number of households	17,632	252,582
Persons per household	2.60	2.46
High school graduates	89.9%	79.5%
Median Family Income	\$45,101	\$34,300
Percent below poverty level	4.8%	13.0%



### **Solid waste collection**

Solid waste is collected by several private waste haulers in Lee's Summit. The city licenses the haulers but does not franchise or set up collection zones. Waste haulers are required to offer curbside recycling to their customers.

### **Solid waste disposal**

The City of Lee's Summit owns and operates the landfill. The landfill accepts waste from Lee's Summit and the surrounding communities. The current tipping fee for solid waste is \$6.50 per cubic yard. The landfill receives approximately 110,000 tons of solid waste per year.

### **Waste reduction and recycling programs**

The Lee's Summit recycling drop-off center began as a project operated by a local not-for profit organization. In 1992, the center was acquired by the City and became part of an integrated municipal solid waste management plan. Many recyclables and some banned items are accepted at this center. In addition to these efforts, the City has mandated that all trash haulers operating within the City limits must offer curbside recycling, and a group of rotating recycling centers was formed for residents use. Lee's Summit also operates a yard waste composting facility at the landfill.

### **Lee's Summit Results**

Information about sample size and composition are listed in tables 10-1 through 10-8

**All weights are listed in pounds and all volumes are in cubic feet.**

## **SORT # 1**

### **Sort Conditions**

The first sort was conducted March 25th through the 29th. The sort facility was set up in the landfill adjacent to the unloading area. Weather conditions were sunny and cold.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	400,000
<b>Total Sample Weight (lbs)</b>	3,471.6
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	14

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	6	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	4	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	6	<b>Gardening/Yard Care Products</b>	3
<b>Household Cleaning Products</b>	1	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	2	<b>Disposable Razors</b>	20
<b>Syringes</b>	8	<b>Alkaline Batteries</b>	32
<b>Hardware/Shop Products</b>	2	<b>Automobile Maintenance/Cleaning Products</b>	5
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> 1 container of shoe polish, 1 printer cartridge, 1 container with boric acid, 1 fluorescent tube.			



# LEE'S SUMMIT

## SORT #1

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	274	60.6	100%	0%	Curb side/ Drop-off	City of Lee's Summit
2	202	48.7	100%	0%	Curb side/ Drop-off	City of Lee's Summit
3	287	63.4	100%	0%	Curb side/ Drop-off	City of Lee's Summit
4	213.9	40.5	100%	0%	Curb side/ Drop-off	City of Lee's Summit
5	287.5	63.8	100%	0%	Curb side/ Drop-off	Raytown and Lee's Summit
6	222.5	58.3	100%	0%	Curb side/ Drop-off	City of Lee's Summit
7	274	59.2	100%	0%	Curb side/ Drop-off	City of Lee's Summit
8	178	33.1	100%	0%	Curb side/ Drop-off	City of Lee's Summit
9	229	56.2	90%	10%	Curb side/ Drop-off	City of Lee's Summit
10	303	63.7	100%	0%	Curb side/ Drop-off	City of Lee's Summit
11	292	54.5	100%	0%	Curb side/ Drop-off	City of Lee's Summit
12	290.9	40.2	30%	70%	Curb side/ Drop-off	City of Lee's Summit
13	217.5	43.5	100%	0%	Curb side/ Drop-off	City of Lee's Summit
14	200.3	39.5	100%	0%	Curb side/ Drop-off	City of Lee's Summit
<b>TOTALS</b>	<b>3471.6</b>	<b>725.2</b>				
<b>AVERAGE</b>	<b>248.0</b>	<b>51.8</b>	<b>94%</b>	<b>6%</b>		

TABLE 10-1

CATEGORY	LEE'S SUMMIT				SORT # 1	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	246.7	93.0	17.6	6.6	7.11%	12.83%
Newsprint	514.6	72.5	36.8	5.2	14.83%	9.99%
Magazines	143.9	15.2	10.3	1.1	4.15%	2.09%
High Grade	94.9	15.5	6.8	1.1	2.73%	2.13%
Mixed	530.3	130.5	37.9	9.3	15.28%	18.00%
<b>PAPER TOTALS</b>	<b>1530.4</b>	<b>326.6</b>	<b>109.3</b>	<b>23.3</b>	<b>44.10%</b>	<b>45.04%</b>
Clear	109.2	17.1	7.8	1.2	3.15%	2.35%
Brown	42.2	11.1	3.0	0.8	1.22%	1.52%
Green	20.2	5.3	1.4	0.4	0.58%	0.73%
Other	25.2	2.3	1.8	0.2	0.72%	0.31%
<b>GLASS TOTALS</b>	<b>196.8</b>	<b>35.7</b>	<b>14.1</b>	<b>2.5</b>	<b>5.67%</b>	<b>4.92%</b>
Alum. Cans	51.5	22.6	3.7	1.6	1.48%	3.12%
Other Alum	16.6	7.2	1.2	0.5	0.48%	0.99%
Non ferrous	7.5	0.7	0.5	0.1	0.22%	0.10%
Food Cans	83.7	18.0	6.0	1.3	2.41%	2.48%
Ferrous	19.1	3.9	1.4	0.3	0.55%	0.54%
Oil Filters	2.5	0.1	0.2	0.0	0.07%	0.01%
<b>METAL TOTALS</b>	<b>180.9</b>	<b>52.5</b>	<b>12.9</b>	<b>3.8</b>	<b>5.21%</b>	<b>7.24%</b>
PET # 1	41.7	21.5	3.0	1.5	1.20%	2.96%
HDPE # 2	55.4	33.0	4.0	2.4	1.60%	4.55%
Film	108.4	58.0	7.7	4.1	3.12%	8.00%
Other Plastic	157.0	71.0	11.2	5.1	4.52%	9.79%
<b>PLASTIC TOTALS</b>	<b>362.5</b>	<b>183.5</b>	<b>25.9</b>	<b>13.1</b>	<b>10.45%</b>	<b>25.31%</b>
Food Waste	486.0	41.7	34.7	3.0	14.00%	5.75%
Wood Waste	20.3	4.2	1.5	0.3	0.58%	0.58%
Textiles	118.0	23.7	8.4	1.7	3.40%	3.27%
Diapers	207.2	14.7	14.8	1.1	5.97%	2.03%
Other Organics	114.0	22.0	8.1	1.6	3.28%	3.03%
<b>ORGANIC TOTALS</b>	<b>945.5</b>	<b>106.3</b>	<b>67.5</b>	<b>7.6</b>	<b>27.24%</b>	<b>14.66%</b>
Fines	172.0	14.0	12.3	1.0	4.96%	1.93%
Other Inorganics	82.2	6.6	5.9	0.5	2.37%	0.90%
<b>INORGANIC TOTALS</b>	<b>254.2</b>	<b>20.6</b>	<b>18.2</b>	<b>1.5</b>	<b>7.33%</b>	<b>2.83%</b>
<b>GRAND TOTAL</b>	<b>3470.2</b>	<b>725.0</b>	<b>247.9</b>	<b>51.8</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 10-2





## **SORT # 2**

### **Sort Conditions**

The second sort was conducted July 1st through the 3rd. The sort facility was set up near the maintenance facility, approximately ¼ mile from the tipping area. The samples were transported to and from the facility by trailer. Weather conditions were sunny, humid, and very hot.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	400,000
Total Sample Weight (lbs)	2,648
Significance Test Results	.000
Number of Samples	12

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	3	Beauty/Hygiene Aerosol Products	1
Prescription Medication (Rx)	3	Household Cleaning Aerosol Products	1
Beauty/Hygiene Products	31	Gardening/Yard Care Products	1
Household Cleaning Products	5	Pet Groom Products	3
Sharps/Blades	2	Disposable Razors	3
Syringes	2	Alkaline Batteries	13
Hardware/Shop Products	7	Automobile Maintenance/Cleaning Products	2
Aerosol Cans	4		
Miscellaneous items: 1 container of lamp oil, 1 thermometer.			



# LEE'S SUMMIT

## SORT # 2

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	264	45.3	95%	5%	Drop-off	Lee's Summit
2	346	59	100%	0%	Drop-off	Grandview
3	270	47	100%	0%	Drop-off	Lee's Summit
4	249	47.8	100%	0%	Drop-off	Lee's Summit
5	209.5	29.5	100%	0%	Drop-off	Lee's Summit
6	251.5	40.7	80%	20%	Drop-off	Lee's Summit
7	231	51.3	90%	10%	Drop-off	Lee's Summit
8	135	31.2	90%	10%	Drop-off	Lee's Summit
9	183	35.8	60%	40%	Drop-off	Lee's Summit
10	212	37.1	80%	20%	Drop-off	Lee's Summit
11	118	24.2	60%	40%	Drop-off	Independence
12	179	29.3	70%	30%	Drop-off	Lee's Summit
<b>TOTALS</b>	<b>2648</b>	<b>478.2</b>				
<b>AVERAGE</b>	<b>220.7</b>	<b>39.9</b>	<b>85%</b>	<b>15%</b>		

TABLE 10-3

**LEE'S SUMMIT****SORT # 2**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	174.0	57.5	14.5	4.8	6.57%	12.04%
Newsprint	291.0	44.0	24.3	3.7	10.99%	9.21%
Magazines	132.0	14.0	11.0	1.2	4.99%	2.93%
High Grade	79.0	9.3	6.6	0.8	2.98%	1.95%
Mixed	319.0	71.2	26.6	5.9	12.05%	14.91%
<b>PAPER TOTALS</b>	<b>995.0</b>	<b>196.0</b>	<b>82.9</b>	<b>16.3</b>	<b>37.58%</b>	<b>41.05%</b>
Clear	74.0	8.4	6.2	0.7	2.80%	1.76%
Brown	27.0	2.4	2.3	0.2	1.02%	0.50%
Green	12.0	1.4	1.0	0.1	0.45%	0.29%
Other	20.0	1.7	1.7	0.1	0.76%	0.36%
<b>GLASS TOTALS</b>	<b>133.0</b>	<b>13.9</b>	<b>11.1</b>	<b>1.2</b>	<b>5.02%</b>	<b>2.91%</b>
Alum. Cans	48.5	11.8	4.0	1.0	1.83%	2.47%
Other Alum	26.0	2.6	2.2	0.2	0.98%	0.54%
Non ferrous	9.0	0.8	0.8	0.1	0.34%	0.17%
Food Cans	78.0	10.8	6.5	0.9	2.95%	2.26%
Ferrous	41.0	3.6	3.4	0.3	1.55%	0.75%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>202.5</b>	<b>29.6</b>	<b>16.9</b>	<b>2.5</b>	<b>7.65%</b>	<b>6.20%</b>
PET # 1	51.0	24.5	4.3	2.0	1.93%	5.13%
HDPE # 2	62.0	29.5	5.2	2.5	2.34%	6.18%
Film	90.0	33.0	7.5	2.8	3.40%	6.91%
Other Plastic	189.0	50.2	15.8	4.2	7.14%	10.51%
<b>PLASTIC TOTALS</b>	<b>392.0</b>	<b>137.2</b>	<b>32.7</b>	<b>11.4</b>	<b>14.81%</b>	<b>28.73%</b>
Food Waste	367.0	34.6	30.6	2.9	13.86%	7.25%
Wood Waste	49.0	5.6	4.1	0.5	1.85%	1.17%
Textiles	109.0	15.2	9.1	1.3	4.12%	3.18%
Diapers	100.0	10.7	8.3	0.9	3.78%	2.24%
Other Organics	182.0	23.2	15.2	1.9	6.87%	4.86%
<b>ORGANIC TOTALS</b>	<b>807.0</b>	<b>89.3</b>	<b>67.3</b>	<b>7.4</b>	<b>30.48%</b>	<b>18.70%</b>
Fines	50.0	5.6	4.2	0.5	1.89%	1.17%
Other Inorganics	68.0	5.9	5.7	0.5	2.57%	1.24%
<b>INORGANIC TOTALS</b>	<b>118.0</b>	<b>11.5</b>	<b>9.8</b>	<b>1.0</b>	<b>4.46%</b>	<b>2.41%</b>
<b>GRAND TOTAL</b>	<b>2647.5</b>	<b>477.5</b>	<b>220.6</b>	<b>39.8</b>	<b>100.00%</b>	<b>100.00%</b>







### **SORT #3**

#### **Sort Conditions**

The third sort was conducted on October 28<sup>th</sup> and 29<sup>th</sup>. The sort facility was set up near the maintenance facility, approximately ¼ mile from the tipping area. The samples were transported to and from the facility by trailer. Weather conditions were sunny, and mild the first day. Rain and high winds on the second day caused difficulty in obtaining samples and therefore the sort was ended after only 9 samples.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	400,000
<b>Total Sample Weight (lbs)</b>	2,366.1
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	9

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-Counter Medication (OTC)</b>	0	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	1	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	3	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	0	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	8
<b>Syringes</b>	0	<b>Alkaline Batteries</b>	8
<b>Hardware/Shop Products</b>	0	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> 1 container fly abatement for houses.			



**LEE'S SUMMIT  
SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	280	41.8	0%	100%	Curbside/Drop-off	Lee's Summit
2	232	34.8	90%	10%	Curbside/Drop-off	Lee's Summit (John Knox Village)
3	290	43	100%	0%	Curbside/Drop-off	Lee's Summit (John Knox Village)
4	288.6	51.9	100%	0%	Curbside/Drop-off	Lee's Summit
5	259.5	51.4	100%	0%	Curbside/Drop-off	Lee's Summit
6	209	46.2	100%	0%	Curbside/Drop-off	Lee's Summit
7	267	57.5	70%	30%	Curbside/Drop-off	Lee's Summit
8	302	59.6	100%	0%	Curbside/Drop-off	Blue Springs
9	238	50.7	50%	50%	Curbside/Drop-off	Unity Village
<b>TOTALS</b>	<b>2366.1</b>	<b>436.9</b>				
<b>AVERAGE</b>	<b>262.9</b>	<b>48.5</b>	<b>79%</b>	<b>21%</b>		

TABLE 10-5

**LEE'S SUMMIT****SORT # 3**

CATEGORY	TOTALS		AVERAGE		PERCENTAGES	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	121.9	41.0	13.5	4.6	5.15%	9.39%
Newsprint	305.5	32.0	33.9	3.6	12.92%	7.33%
Magazines	99.0	12.1	11.0	1.3	4.19%	2.77%
High Grade	148.0	22.7	16.4	2.5	6.26%	5.20%
Mixed	314.0	72.5	34.9	8.1	13.28%	16.60%
<b>PAPER TOTALS</b>	<b>988.4</b>	<b>180.3</b>	<b>109.8</b>	<b>20.0</b>	<b>41.79%</b>	<b>41.28%</b>
Clear	67.5	5.5	7.5	0.6	2.85%	1.26%
Brown	62.5	6.3	6.9	0.7	2.64%	1.44%
Green	9.5	1.9	1.1	0.2	0.40%	0.43%
Other	23.0	2.3	2.6	0.3	0.97%	0.53%
<b>GLASS TOTALS</b>	<b>162.5</b>	<b>16.0</b>	<b>18.1</b>	<b>1.8</b>	<b>6.87%</b>	<b>3.66%</b>
Alum. Cans	43.0	13.0	4.8	1.4	1.82%	2.98%
Other Alum	23.0	4.1	2.6	0.5	0.97%	0.94%
Non ferrous	2.1	0.2	0.2	0.0	0.09%	0.05%
Food Cans	71.0	12.3	7.9	1.4	3.00%	2.82%
Ferrous	19.0	2.3	2.1	0.3	0.80%	0.53%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>158.1</b>	<b>31.9</b>	<b>17.6</b>	<b>3.5</b>	<b>6.68%</b>	<b>7.30%</b>
PET # 1	32.5	12.3	3.6	1.4	1.37%	2.80%
HDPE # 2	48.5	21.7	5.4	2.4	2.05%	4.97%
Film	75.5	35.8	8.4	4.0	3.19%	8.18%
Other Plastic	145.0	55.3	16.1	6.1	6.13%	12.66%
<b>PLASTIC TOTALS</b>	<b>301.5</b>	<b>125.0</b>	<b>33.5</b>	<b>13.9</b>	<b>12.75%</b>	<b>28.62%</b>
Food Waste	432.5	39.0	48.1	4.3	18.29%	8.93%
Wood Waste	16.1	1.8	1.8	0.2	0.68%	0.41%
Textiles	84.5	13.3	9.4	1.5	3.57%	3.04%
Diapers	100.0	10.6	11.1	1.2	4.23%	2.43%
Other Organics	55.6	9.7	6.2	1.1	2.35%	2.22%
<b>ORGANIC TOTALS</b>	<b>688.7</b>	<b>74.4</b>	<b>76.5</b>	<b>8.3</b>	<b>29.12%</b>	<b>17.03%</b>
Fines	32.0	5.0	3.6	0.6	1.35%	1.14%
Other Inorganics	34.0	4.2	3.8	0.5	1.44%	0.96%
<b>INORGANIC TOTALS</b>	<b>66.0</b>	<b>9.2</b>	<b>7.3</b>	<b>1.0</b>	<b>2.79%</b>	<b>2.11%</b>
<b>GRAND TOTAL</b>	<b>2365.2</b>	<b>436.8</b>	<b>262.8</b>	<b>48.5</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 10-6



## **SORT SUMMARY**

### **Seasonal variations**

- High grade paper was higher during the third sort. A larger percentage of commercial waste was sorted during the third round. Most of that commercial waste seemed to come from doctors offices.
- Brown glass containers were higher during the third round. No obvious cause.
- Other plastics were higher during the second sort. No obvious cause.
- Other organics were higher during the second sort. Several bags of yard waste were found.
- Fines were higher during the first sort. Modification in the sorting procedure caused more of the fines to be sorted into the appropriate categories in the second and third round.

### **Sort results**

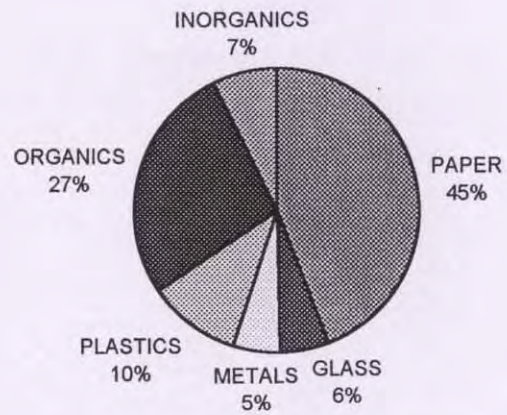
- Chart 10-1 graphically compares the three seasonal waste sort results and shows the average waste composition, by major category, for Lee's Summit.
- The sample data for all Lee's Summit sorts is listed on table 10-7.
- The sort results for all Lee's Summit sorts are listed on table 10-8.
- The summary of statistical relevance for the Lee's Summit sorts is located on page 158.
- The total for all "other wastes" found during the Lee's Summit sorts is on page 158.

**All weights are in pounds and volumes are listed in cubic feet.**

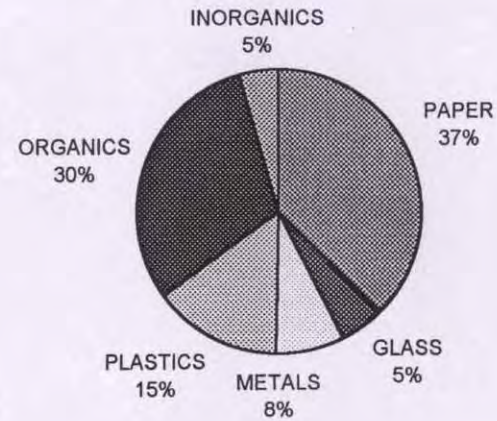
Comparisons of the Lee's Summit waste stream to previous studies and other communities can be found in chapter 13.

## LEE'S SUMMIT RESULTS BY WEIGHT

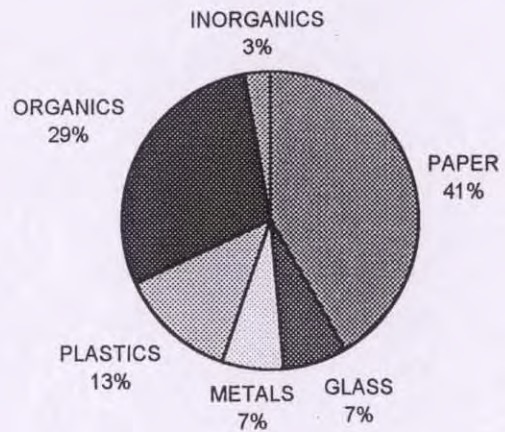
**SORT #1**



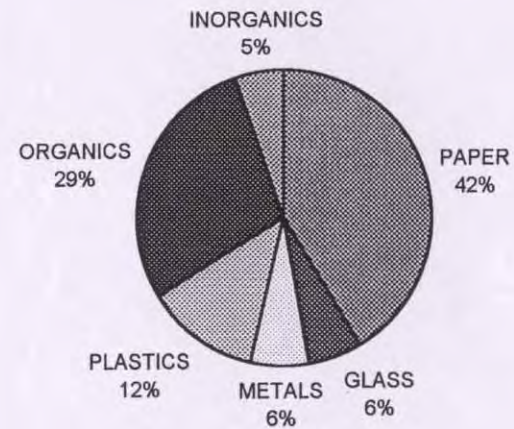
**SORT #2**



**SORT #3**



**SORT AVERAGE**





# **LEE'S SUMMIT SAMPLE SUMMARY**

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	3/25-3/27	14	3471.6	725.2	94%	6%
2	7/1-7/3	12	2648.0	478.2	85%	15%
3	10/28-10/30	9	2366.1	436.9	79%	21%
<b>TOTALS</b>		<b>35.0</b>	<b>8485.7</b>	<b>1640.3</b>		
<b>AVERAGE</b>		<b>11.7</b>	<b>2828.6</b>	<b>546.8</b>	<b>86%</b>	<b>14%</b>

TABLE 10-7

CATEGORY	LEE'S SUMMIT						SUMMARY	
	SORT # 1		SORT # 2		SORT #3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	7.1%	12.8%	6.6%	12.0%	5.2%	9.4%	6.4%	11.7%
Newsprint	14.8%	10.0%	11.0%	9.2%	12.9%	7.3%	13.1%	9.1%
Magazines	4.1%	2.1%	5.0%	2.9%	4.2%	2.8%	4.4%	2.5%
High Grade	2.7%	2.1%	3.0%	1.9%	6.3%	5.2%	3.8%	2.9%
Mixed	15.3%	18.0%	12.0%	14.9%	13.3%	16.6%	13.7%	16.7%
<b>PAPER TOTALS</b>	<b>44.1%</b>	<b>45.0%</b>	<b>37.6%</b>	<b>41.0%</b>	<b>41.8%</b>	<b>41.3%</b>	<b>41.4%</b>	<b>42.9%</b>
Clear	3.1%	2.4%	2.8%	1.8%	2.9%	1.3%	3.0%	1.9%
Brown	1.2%	1.5%	1.0%	0.5%	2.6%	1.4%	1.6%	1.2%
Green	0.6%	0.7%	0.5%	0.3%	0.4%	0.4%	0.5%	0.5%
Other	0.7%	0.3%	0.8%	0.4%	1.0%	0.5%	0.8%	0.4%
<b>GLASS TOTALS</b>	<b>5.7%</b>	<b>4.9%</b>	<b>5.0%</b>	<b>2.9%</b>	<b>6.9%</b>	<b>3.7%</b>	<b>5.8%</b>	<b>4.0%</b>
Alum. Cans	1.5%	3.1%	1.8%	2.5%	1.8%	3.0%	1.7%	2.9%
Other Alum	0.5%	1.0%	1.0%	0.5%	1.0%	0.9%	0.8%	0.8%
Non ferrous	0.2%	0.1%	0.3%	0.2%	0.1%	0.0%	0.2%	0.1%
Food Cans	2.4%	2.5%	2.9%	2.3%	3.0%	2.8%	2.7%	2.5%
Ferrous	0.6%	0.5%	1.5%	0.8%	0.8%	0.5%	0.9%	0.6%
Oil Filters	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>METAL TOTALS</b>	<b>5.2%</b>	<b>7.2%</b>	<b>7.6%</b>	<b>6.2%</b>	<b>6.7%</b>	<b>7.3%</b>	<b>6.4%</b>	<b>7.0%</b>
PET # 1	1.2%	3.0%	1.9%	5.1%	1.4%	2.8%	1.5%	3.6%
HDPE # 2	1.6%	4.5%	2.3%	6.2%	2.1%	5.0%	2.0%	5.1%
Film	3.1%	8.0%	3.4%	6.9%	3.2%	8.2%	3.2%	7.7%
Other Plastic	4.5%	9.8%	7.1%	10.5%	6.1%	12.7%	5.8%	10.8%
<b>PLASTIC TOTALS</b>	<b>10.4%</b>	<b>25.3%</b>	<b>14.8%</b>	<b>28.7%</b>	<b>12.7%</b>	<b>28.6%</b>	<b>12.4%</b>	<b>27.2%</b>
Food Waste	14.0%	5.7%	13.9%	7.2%	18.3%	8.9%	15.2%	7.0%
Wood Waste	0.6%	0.6%	1.9%	1.2%	0.7%	0.4%	1.0%	0.7%
Textiles	3.4%	3.3%	4.1%	3.2%	3.6%	3.0%	3.7%	3.2%
Diapers	6.0%	2.0%	3.8%	2.2%	4.2%	2.4%	4.8%	2.2%
Other Organics	3.3%	3.0%	6.9%	4.9%	2.4%	2.2%	4.1%	3.3%
<b>ORGANIC TOTALS</b>	<b>27.2%</b>	<b>14.7%</b>	<b>30.5%</b>	<b>18.7%</b>	<b>29.1%</b>	<b>17.0%</b>	<b>28.8%</b>	<b>16.5%</b>
Fines	5.0%	1.9%	1.9%	1.2%	1.4%	1.1%	3.0%	1.5%
Other Inorganics	2.4%	0.9%	2.6%	1.2%	1.4%	1.0%	2.2%	1.0%
<b>INORGANIC TOTALS</b>	<b>7.3%</b>	<b>2.8%</b>	<b>4.5%</b>	<b>2.4%</b>	<b>2.8%</b>	<b>2.1%</b>	<b>5.2%</b>	<b>2.5%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 10-8



Lee's Summit Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	400,000
Total Sample Weight (lbs)	8,485.7
Total Number of Samples Collected	34
Significance Test Results	.000
Mean Sample (lbs) and Confidence Interval (95%)	241.04 (+/-) 17.40

City of Lee's Summit "Other Waste" Summary			
Over-the-Counter Medication (OTC)	9	Beauty/Hygiene aerosol Products	1
Prescription Medication (Rx)	8	Household Cleaning Aerosol Products	1
Beauty/Hygiene Products	40	Gardening/Yard Care Products	4
Household Cleaning Products	6	Pet Groom Products	3
Sharps/Blades	4	Disposable Razors	31
Syringes	10	Alkaline Batteries	53
Hardware/Shop Products	9	Automobile Maintenance/Cleaning Products	7
Aerosol Cans	4		
<b>Miscellaneous items:</b> 1 container shoe polish, 1 printer cartridge, 1 container of boric acid, 1 fluorescent tube, 1 container of lamp oil, 1 thermometer, 1 container fly protectant for houses.			



## Chapter 11: Clinton

### COMMUNITY PROFILE

The City of Clinton is the county seat of Henry County which is located in West Central Missouri. A majority of the waste sampled during all three sorts was generated in Henry and Benton County. The City of Clinton, Henry County, and Benton County are all members of the Quad-Lakes Solid Waste Management District (District J). The City of Clinton is the largest city in the District. The leading areas of employment in the District are manufacturing, agriculture, and retail trade. The geography of the area (which includes 4 recreational lakes) also makes this area a popular tourist and recreational site. All of the waste sorts were conducted at Ellis Scott Landfill which is 7 miles north of Clinton on highway 13

Clinton is 78 miles southeast of Kansas City, 89 miles north of Springfield, and 232 miles west of St. Louis.

#### Demographics:

	Henry County	Benton County
Area (sq. miles)	703	706
Population (1992)	20,215	14,417
Density (per sq. mile)	29	20
Pop. Change since 1980	2.8%	18.3%
Number of households	8189	5764
Persons per household	2.41	2.37
High school graduates	67.6%	64.5%
Median Family Income	\$22,986	\$19,946
Percent below poverty level	18.1%	20.2%



### **Solid waste collection**

Solid waste collection throughout the District is provided by both municipal and private waste haulers.

### **Solid waste disposal**

The Ellis- Scott Landfill is located 7 miles north of Clinton on highway 13. It is the only approved landfill in the District. It is privately owned and operated by USA Waste Inc.. The landfill receives approximately 55,000 tons of waste per year. The current tipping fee is \$23.25 per ton.

### **Waste reduction and recycling programs**

The current recycling rate in District J. is less than 1%. All recycling services are privately operated.. These programs mainly collect copper, aluminum cans, glass, metal, and plastic. Some recycling businesses collect banned items such as white goods and batteries. Only one municipal recycling program is currently operating (City of Butler). Four cities in the District currently operate composting facilities.

### **Clinton Results**

Information about sample size and composition are listed in tables 11-1 through 11-8

**All weights are listed in pounds and all volumes are in cubic feet.**

## **SORT # 1**

### **Sort Conditions**

The first sort was conducted on April 1st through the 5th. The sort facility was set up in the landfill just above the unloading area. Weather conditions were cool and extremely windy. The first day of sorting was canceled due to strong winds. The sort was stopped after eight samples due to the high winds on the second day.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	400,000
Total Sample Weight (lbs)	2,648
Significance Test Results	.000
Number of Samples	8

### **Other Waste Category**

High winds blew over the other waste container and scattered the waste before it could be recorded.



# CLINTON SORT #1

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	189.0	36.6	100%	0%	None	Humansville
2	258.5	52.7	95%	5%	None	Appleton
3	135.0	33.8	50%	50%	Drop-off	Clinton
4	188.8	38.9	80%	20%	Drop-off	Warsaw
5	206.8	42.2	80%	20%	Drop-off	Warsaw
6	226.0	47.7	70%	30%	Drop-off	Osceola
7	230.0	55.0	70%	30%	Drop-off	Osceola
8	170.0	35.9	80%	20%	Drop-off	Calhoon and Clinton
<b>TOTALS</b>	<b>1604.1</b>	<b>342.8</b>				
<b>AVERAGE</b>	<b>200.5</b>	<b>42.8</b>	<b>78%</b>	<b>22%</b>		

TABLE 11-1

CATEGORY	CLINTON				SORT # 1	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	80.5	30.3	10.1	3.8	5.03%	8.84%
Newsprint	88.7	14.5	11.1	1.8	5.54%	4.23%
Magazines	46.5	13.1	5.8	1.6	2.90%	3.82%
High Grade	106.5	19.2	13.3	2.4	6.65%	5.60%
Mixed	385.4	85.5	48.2	10.7	24.06%	24.95%
<b>PAPER TOTALS</b>	<b>707.6</b>	<b>162.6</b>	<b>88.4</b>	<b>20.3</b>	<b>44.17%</b>	<b>47.45%</b>
Clear	59.7	6.9	7.5	0.9	3.73%	2.01%
Brown	11.0	1.2	1.4	0.2	0.69%	0.35%
Green	5.0	0.3	0.6	0.0	0.31%	0.09%
Other	3.0	0.3	0.4	0.0	0.19%	0.09%
<b>GLASS TOTALS</b>	<b>78.7</b>	<b>8.7</b>	<b>9.8</b>	<b>1.1</b>	<b>4.91%</b>	<b>2.54%</b>
Alum. Cans	20.5	7.5	2.6	0.9	1.28%	2.17%
Other Alum	9.8	1.8	1.2	0.2	0.61%	0.53%
Non ferrous	3.5	2.5	0.4	0.3	0.22%	0.73%
Food Cans	45.8	10.7	5.7	1.3	2.86%	3.12%
Ferrous	15.4	2.2	1.9	0.3	0.96%	0.64%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>95.0</b>	<b>24.7</b>	<b>11.9</b>	<b>3.1</b>	<b>5.93%</b>	<b>7.19%</b>
PET # 1	31.3	19.7	3.9	2.5	1.95%	5.75%
HDPE # 2	33.7	18.7	4.2	2.3	2.10%	5.46%
Film	51.2	24.0	6.4	3.0	3.20%	7.00%
Other Plastic	92.7	30.9	11.6	3.9	5.79%	9.02%
<b>PLASTIC TOTALS</b>	<b>208.9</b>	<b>93.3</b>	<b>26.1</b>	<b>11.7</b>	<b>13.04%</b>	<b>27.22%</b>
Food Waste	182.5	16.1	22.8	2.0	11.39%	4.68%
Wood Waste	6.0	0.9	0.8	0.1	0.37%	0.26%
Textiles	57.1	10.1	7.1	1.3	3.56%	2.95%
Diapers	127.8	13.8	16.0	1.7	7.98%	4.03%
Other Organics	10.8	1.9	1.4	0.2	0.67%	0.55%
<b>ORGANIC TOTALS</b>	<b>384.2</b>	<b>42.8</b>	<b>48.0</b>	<b>5.3</b>	<b>23.99%</b>	<b>12.47%</b>
Fines	72.2	6.4	9.0	0.8	4.51%	1.87%
Other Inorganics	55.3	4.3	6.9	0.5	3.45%	1.25%
<b>INORGANIC TOTALS</b>	<b>127.5</b>	<b>10.7</b>	<b>15.9</b>	<b>1.3</b>	<b>7.96%</b>	<b>3.12%</b>
<b>GRAND TOTAL</b>	<b>1601.8</b>	<b>342.7</b>	<b>200.2</b>	<b>42.8</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 11-2





## **SORT # 2**

### **Sort Conditions**

The second sort was conducted July 8th through the 10th. The sort facility was set up near the face of the landfill, approximately 300 yards from the unloading area. Weather conditions were seasonably mild and overcast.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	400,000
<b>Total Sample Weight (lbs)</b>	2,879.5
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	2	<b>Beauty/Hygiene Aerosol Products</b>	3
<b>Prescription Medication (Rx)</b>	2	<b>Household Cleaning Aerosol Products</b>	1
<b>Beauty/Hygiene Products</b>	4	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	1	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	5	<b>Disposable Razors</b>	6
<b>Syringes</b>	50	<b>Alkaline Batteries</b>	15
<b>Hardware/Shop Products</b>	2	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	3		
<b>Miscellaneous items:</b> 1 container of water colors, 3 packages of fireworks, 1 lighter, 1 small container of propane.			



# CLINTON SORT # 2

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	201.0	46.2	25%	75%	Drop-off	Warsaw/ Tightwad (rural)
2	224.0	44.0	0%	100%	None	Henry Co. (business/rural)
3	166.0	42.6	20%	80%	Drop-off	Warsaw
4	229.0	40.1	50%	50%	None	Garden City
5	305.0	64.7	100%	0%	None	Appleton City
6	191.0	37.3	60%	40%	Drop-off	Osceola/ Collins
7	283.0	58.3	100%	0%	Drop-off	Clinton
8	323.0	70.5	100%	0%	Drop-off	Clinton
9	244.0	59.0	100%	0%	Drop-off	Clinton
10	250.0	56.5	100%	0%	Drop-off	Clinton (Meadow Lake Sub. Div.)
11	239.0	47.0	100%	0%	Drop-off	Clinton (Meadow Lake Sub. Div.)
12	224.5	59.1	100%	0%	None	Harrisonville (rural)
<b>TOTALS</b>	<b>2879.5</b>	<b>625.3</b>				
<b>AVERAGE</b>	<b>240.0</b>	<b>52.1</b>	<b>71%</b>	<b>29%</b>		

TABLE 11-3

CATEGORY	CLINTON				SORT # 2	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	152.0	71.0	12.7	5.9	5.28%	11.36%
Newsprint	242.5	32.3	20.2	2.7	8.43%	5.17%
Magazines	86.5	12.6	7.2	1.1	3.01%	2.02%
High Grade	61.5	10.2	5.1	0.9	2.14%	1.63%
Mixed	418.5	109.3	34.9	9.1	14.54%	17.47%
<b>PAPER TOTALS</b>	<b>961.0</b>	<b>235.4</b>	<b>80.1</b>	<b>19.6</b>	<b>33.39%</b>	<b>37.64%</b>
Clear	156.0	18.0	13.0	1.5	5.42%	2.88%
Brown	73.5	7.6	6.1	0.6	2.55%	1.22%
Green	11.0	1.0	0.9	0.1	0.38%	0.16%
Other	23.0	2.3	1.9	0.2	0.80%	0.37%
<b>GLASS TOTALS</b>	<b>263.5</b>	<b>28.9</b>	<b>22.0</b>	<b>2.4</b>	<b>9.16%</b>	<b>4.62%</b>
Alum. Cans	84.5	36.2	7.0	3.0	2.94%	5.79%
Other Alum	24.0	2.8	2.0	0.2	0.83%	0.45%
Non ferrous	18.0	4.0	1.5	0.3	0.63%	0.64%
Food Cans	90.0	18.2	7.5	1.5	3.13%	2.91%
Ferrous	23.5	1.7	2.0	0.1	0.82%	0.27%
Oil Filters	7.0	0.6	0.6	0.1	0.24%	0.10%
<b>METAL TOTALS</b>	<b>247.0</b>	<b>63.5</b>	<b>20.6</b>	<b>5.3</b>	<b>8.58%</b>	<b>10.16%</b>
PET # 1	57.5	27.5	4.8	2.3	2.00%	4.40%
HDPE # 2	68.0	35.7	5.7	3.0	2.36%	5.71%
Film	85.5	40.5	7.1	3.4	2.97%	6.48%
Other Plastic	183.5	69.9	15.3	5.8	6.38%	11.18%
<b>PLASTIC TOTALS</b>	<b>394.5</b>	<b>173.6</b>	<b>32.9</b>	<b>14.5</b>	<b>13.71%</b>	<b>27.76%</b>
Food Waste	667.5	65.0	55.6	5.4	23.20%	10.40%
Wood Waste	13.2	1.5	1.1	0.1	0.46%	0.24%
Textiles	81.0	25.1	6.8	2.1	2.81%	4.01%
Diapers	83.0	9.0	6.9	0.8	2.88%	1.44%
Other Organics	67.0	9.3	5.6	0.8	2.33%	1.49%
<b>ORGANIC TOTALS</b>	<b>911.7</b>	<b>109.9</b>	<b>76.0</b>	<b>9.2</b>	<b>31.68%</b>	<b>17.58%</b>
Fines	79.0	12.5	6.6	1.0	2.75%	2.00%
Other Inorganics	21.0	1.5	1.8	0.1	0.73%	0.24%
<b>INORGANIC TOTALS</b>	<b>100.0</b>	<b>14.0</b>	<b>8.3</b>	<b>1.2</b>	<b>3.47%</b>	<b>2.24%</b>
<b>GRAND TOTAL</b>	<b>2877.7</b>	<b>625.3</b>	<b>239.8</b>	<b>52.1</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 11-4







### **SORT #3**

#### **Sort Conditions**

The third waste sort was conducted November 4th through the 6th. The sort facility was set upon a grassy knoll, approximately 600 yards from the unloading area. The samples were transported to and from the facility by trailer. Heavy rains on the first day caused very muddy conditions at the tipping area and created difficulty in obtaining samples. The sort was canceled after only 8 samples.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	400,000
<b>Total Sample Weight (lbs)</b>	1,857.5
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	8

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-Counter Medication (OTC)</b>	0	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	0	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	1	<b>Gardening/Yard Care Products</b>	1
<b>Household Cleaning Products</b>	1	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	5
<b>Syringes</b>	1 can	<b>Alkaline Batteries</b>	10
<b>Hardware/Shop Products</b>	2	<b>Automobile Maintenance/Cleaning Products</b>	1
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> 1 container waterproofing paint.			



# CLINTON

## SORT # 3

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	204	38.6	80%	20%	Drop-off	Osceola
2	170	32.6	50%	50%	Drop-off	Warsaw
3	203	34.9	80%	20%	Drop-off	Warsaw
4	269	48.3	50%	50%	Drop-off	Clinton
5	258.5	54	80%	20%	Drop-off	Warsaw
6	262	56.6	50%	50%	Drop-off	Clinton
7	267	51.6	70%	30%	Drop-off	Tightwad
8	224	46.8	60%	40%	Drop-off	Clinton
<b>TOTALS</b>	<b>1857.5</b>	<b>363.4</b>				
<b>AVERAGE</b>	<b>232.2</b>	<b>45.4</b>	<b>65%</b>	<b>35%</b>		

TABLE 11-5

CATEGORY	CLINTON				SORT # 3	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	113.5	39.5	14.2	4.9	6.12%	10.87%
Newsprint	136.5	21.3	17.1	2.7	7.35%	5.86%
Magazines	97.5	9.4	12.2	1.2	5.25%	2.59%
High Grade	43.5	8.6	5.4	1.1	2.34%	2.37%
Mixed	207.5	58.5	25.9	7.3	11.18%	16.10%
<b>PAPER TOTALS</b>	<b>598.5</b>	<b>137.3</b>	<b>74.8</b>	<b>17.2</b>	<b>32.25%</b>	<b>37.78%</b>
Clear	59.0	4.4	7.4	0.6	3.18%	1.21%
Brown	21.0	1.9	2.6	0.2	1.13%	0.52%
Green	14.0	1.3	1.8	0.2	0.75%	0.36%
Other	15.5	2.0	1.9	0.3	0.84%	0.55%
<b>GLASS TOTALS</b>	<b>109.5</b>	<b>9.6</b>	<b>13.7</b>	<b>1.2</b>	<b>5.90%</b>	<b>2.64%</b>
Alum. Cans	34.5	11.2	4.3	1.4	1.86%	3.08%
Other Alum	22.5	2.8	2.8	0.4	1.21%	0.77%
Non ferrous	6.5	0.5	0.8	0.1	0.35%	0.14%
Food Cans	84.5	15.7	10.6	2.0	4.55%	4.32%
Ferrous	31.0	4.5	3.9	0.6	1.67%	1.24%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>179.0</b>	<b>34.7</b>	<b>22.4</b>	<b>4.3</b>	<b>9.64%</b>	<b>9.55%</b>
PET # 1	38.5	13.5	4.8	1.7	2.07%	3.71%
HDPE # 2	46.5	19.5	5.8	2.4	2.51%	5.37%
Film	61.5	29.5	7.7	3.7	3.31%	8.12%
Other Plastic	118.0	45.3	14.8	5.7	6.36%	12.47%
<b>PLASTIC TOTALS</b>	<b>264.5</b>	<b>107.8</b>	<b>33.1</b>	<b>13.5</b>	<b>14.25%</b>	<b>29.66%</b>
Food Waste	377.5	36.0	47.2	4.5	20.34%	9.91%
Wood Waste	49.0	5.4	6.1	0.7	2.64%	1.49%
Textiles	42.0	6.6	5.3	0.8	2.26%	1.82%
Diapers	68.0	8.3	8.5	1.0	3.66%	2.28%
Other Organics	124.5	10.3	15.6	1.3	6.71%	2.83%
<b>ORGANIC TOTALS</b>	<b>661.0</b>	<b>66.6</b>	<b>82.6</b>	<b>8.3</b>	<b>35.61%</b>	<b>18.33%</b>
Fines	33.5	6.7	4.2	0.8	1.80%	1.84%
Other Inorganics	10.0	0.7	1.3	0.1	0.54%	0.19%
<b>INORGANIC TOTALS</b>	<b>43.5</b>	<b>7.4</b>	<b>5.4</b>	<b>0.9</b>	<b>2.34%</b>	<b>2.04%</b>
<b>GRAND TOTAL</b>	<b>1856.0</b>	<b>363.4</b>	<b>232.0</b>	<b>45.4</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 11-6



## **SORT SUMMARY**

### **Seasonal variations**

- The second round of waste sorts were conducted after the July 4<sup>th</sup> holiday weekend. This resulted in a high percentage of clear and brown glass (mostly beer bottles), Aluminum cans, and food wastes (Several watermelon rinds).
- Mixed paper and high grade paper percentages were higher during the first round. No obvious cause
- Other inorganics were higher during the first round due to large amounts of kitty litter. Other organics were higher during the third round due to wet leaves.

### **Sort results**

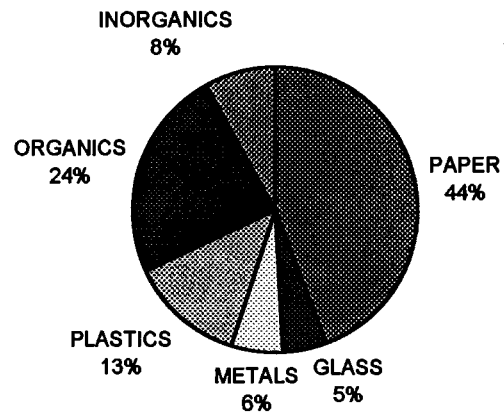
- Chart 11-1 graphically compares the three seasonal waste sort results and shows the average waste composition, by major category, for Clinton.
- The sample data for all Clinton sorts is listed on table 11-7.
- The sort results for all Clinton sorts are listed on table 11-8.
- The summary of statistical relevance for the Clinton sorts is located on page 176.
- The total for all “other wastes” found during the Clinton sorts is on page 176.

**All weights are in pounds and volumes are listed in cubic feet.**

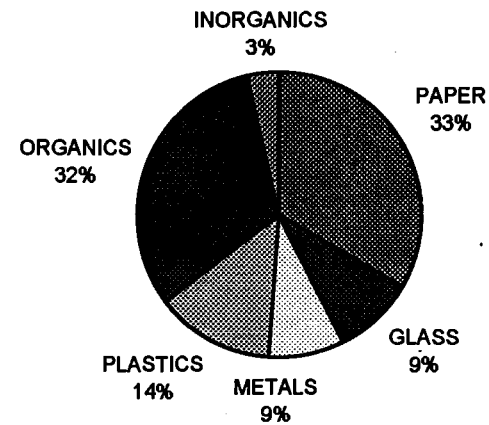
Comparisons of the Clinton waste stream to previous studies and other communities can be found in chapter 13.

## CLINTON RESULTS BY WEIGHT

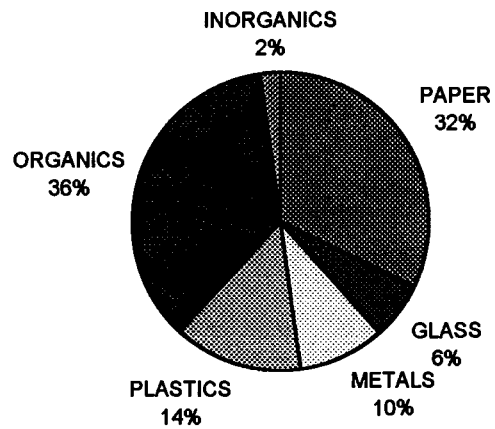
**SORT #1**



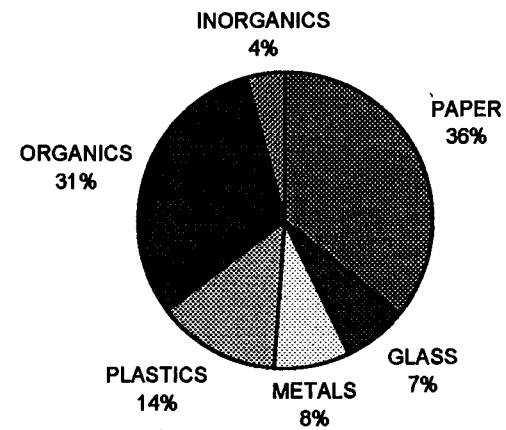
**SORT #2**



**SORT #3**



**SORT AVERAGE**





# CLINTON SAMPLE SUMMARY

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	4/1-4/3	8	1604.0	343.0	78%	22%
2	7/8-7/10	12	2880.0	625.0	71%	29%
3	11/4-11/6	8	1857.5	363.4	65%	35%
<b>TOTALS</b>		<b>28.0</b>	<b>6341.5</b>	<b>1331.4</b>		
<b>AVERAGE</b>		<b>9.3</b>	<b>2113.8</b>	<b>443.8</b>	<b>71%</b>	<b>29%</b>

TABLE 11-7



CATEGORY	CLINTON						SUMMARY	
	SORT # 1		SORT # 2		SORT #3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	5.0%	8.8%	5.3%	11.4%	6.1%	11.0%	5.5%	10.6%
Newsprint	5.5%	4.2%	8.4%	5.2%	7.4%	5.8%	7.4%	5.1%
Magazines	2.9%	3.8%	3.0%	2.0%	5.2%	2.6%	3.6%	2.6%
High Grade	6.6%	5.6%	2.1%	1.6%	2.3%	2.4%	3.3%	2.9%
Mixed	24.1%	24.9%	14.5%	17.5%	11.2%	16.2%	16.0%	19.0%
<b>PAPER TOTALS</b>	<b>44.2%</b>	<b>47.4%</b>	<b>33.4%</b>	<b>37.6%</b>	<b>32.3%</b>	<b>37.8%</b>	<b>35.8%</b>	<b>40.2%</b>
Clear	3.7%	2.0%	5.4%	2.9%	3.2%	1.2%	4.3%	2.2%
Brown	0.7%	0.4%	2.6%	1.2%	1.1%	0.5%	1.7%	0.8%
Green	0.3%	0.1%	0.4%	0.2%	0.8%	0.4%	0.5%	0.2%
Other	0.2%	0.1%	0.8%	0.4%	0.8%	0.5%	0.7%	0.3%
<b>GLASS TOTALS</b>	<b>4.9%</b>	<b>2.5%</b>	<b>9.2%</b>	<b>4.6%</b>	<b>5.9%</b>	<b>2.6%</b>	<b>7.1%</b>	<b>3.5%</b>
Alum. Cans	1.3%	2.2%	2.9%	5.8%	1.9%	3.0%	2.2%	4.1%
Other Alum	0.6%	0.5%	0.8%	0.4%	1.2%	0.8%	0.9%	0.6%
Non ferrous	0.2%	0.7%	0.6%	0.6%	0.3%	0.1%	0.4%	0.5%
Food Cans	2.9%	3.1%	3.1%	2.9%	4.5%	4.4%	3.5%	3.4%
Ferrous	1.0%	0.6%	0.8%	0.3%	1.7%	1.2%	1.1%	0.6%
Oil Filters	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.1%	0.0%
<b>METAL TOTALS</b>	<b>5.9%</b>	<b>7.2%</b>	<b>8.6%</b>	<b>10.2%</b>	<b>9.6%</b>	<b>9.5%</b>	<b>8.2%</b>	<b>9.2%</b>
PET # 1	2.0%	5.7%	2.0%	4.4%	2.1%	3.8%	2.0%	4.6%
HDPE # 2	2.1%	5.5%	2.4%	5.7%	2.5%	5.5%	2.3%	5.6%
Film	3.2%	7.0%	3.0%	6.5%	3.3%	8.2%	3.1%	7.1%
Other Plastic	5.8%	9.0%	6.4%	11.2%	6.3%	12.3%	6.2%	10.9%
<b>PLASTIC TOTALS</b>	<b>13.0%</b>	<b>27.2%</b>	<b>13.7%</b>	<b>27.8%</b>	<b>14.2%</b>	<b>29.9%</b>	<b>13.7%</b>	<b>28.2%</b>
Food Waste	11.4%	4.7%	23.2%	10.4%	20.3%	9.9%	19.4%	8.8%
Wood Waste	0.4%	0.3%	0.5%	0.2%	2.6%	1.5%	1.1%	0.6%
Textiles	3.6%	2.9%	2.8%	4.0%	2.3%	1.8%	2.8%	3.1%
Diapers	8.0%	4.0%	2.9%	1.4%	3.7%	2.3%	4.4%	2.3%
Other Organics	0.7%	0.6%	2.3%	1.5%	6.7%	2.7%	3.2%	1.6%
<b>ORGANIC TOTALS</b>	<b>24.0%</b>	<b>12.5%</b>	<b>31.7%</b>	<b>17.6%</b>	<b>35.6%</b>	<b>18.2%</b>	<b>30.9%</b>	<b>16.4%</b>
Fines	4.5%	1.9%	2.7%	2.0%	1.8%	1.8%	2.9%	1.9%
Other Inorganics	3.5%	1.3%	0.7%	0.2%	0.5%	0.2%	1.4%	0.5%
<b>INORGANIC TOTALS</b>	<b>8.0%</b>	<b>3.1%</b>	<b>3.5%</b>	<b>2.2%</b>	<b>2.3%</b>	<b>2.0%</b>	<b>4.3%</b>	<b>2.4%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 11-8



Clinton Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	1,200,000
Total Sample Weight (lbs)	6341.1
Total Number of Samples Collected	28
Significance Test Results	.000
Mean Sample (lbs) and Confidence Interval (95%)	226.49 (+/-) 16.87

Clinton "Other Waste" Summary			
Over-the-Counter Medication (OTC)	2	Beauty/Hygiene Aerosol Products	3
Prescription Medication (Rx)	2	Household Cleaning Aerosol Products	1
Beauty/Hygiene Products	5	Gardening/Yard Care Products	1
Household Cleaning Products	2	Pet Groom Products	0
Sharps/Blades	5	Disposable Razors	11
Syringes	50+can	Alkaline Batteries	25
Hardware/Shop Products	4	Automobile Maintenance/Cleaning Products	1
Aerosol Cans	3		
Miscellaneous items: 1 container of water colors, 3 packages of fireworks, 1 lighter, 1 container of propane, 1 container of waterproofing paint.			



## Chapter 12: Lamar

### COMMUNITY PROFILE

The City of Lamar is the county seat of Barton County and is located in Southwest Missouri. It is a member of Solid Waste Management District "M". The leading areas of employment in the county are manufacturing, agriculture, and retail trade. All of the waste sorts were conducted at the BFI Landfill, four miles north of Lamar. A majority of the waste sampled during all three sorts was generated in Lamar and Barton County.

Lamar is located on highway 71. It is 74 miles west of Springfield, 122 miles south of Kansas City, and 284 miles southwest of St. Louis.

#### Demographics:

	Lamar	Barton County
Area (sq. miles)	3.4	594
Population (1992)	4,168	11,478
Density (per sq. mile)	1226	19
Pop. Change since 1980	2.8%	1.6%
Number of households	1721	4524
Persons per household	2.29	2.46
High school graduates	64.9	68.2%
Median Family Income	\$28,847	\$25,447
Percent below poverty level	14.2%	14.2%



### *Solid waste collection*

The City of Lamar collects residential trash with the city limits. A private hauler, Sunshine Sanitation collects much of the commercial trash in Lamar and rural residential areas around Lamar. Solid waste collection in other areas is provided by both private and municipal waste haulers.

### *Solid waste disposal*

The Lamar Landfill is located 4 miles north of Lamar on highway 71. It is the only approved landfill in the District. It is privately owned and operated by Browning Ferris Inc. (BFI). The landfill receives approximately 200,000 tons of waste per year. The current tipping fee is \$22.75 per ton.

### *Waste reduction and recycling programs*

There is a drop-off center for recyclables at the BFI Landfill. The landfill manages the drop-off center and markets the recyclables. Approximately 10 tons of recyclable materials are collected at the landfill yearly.

### *Lamar Results*

Information about sample size and composition are listed in tables 12-1 through 12-8

**All weights are listed in pounds and all volumes are in cubic feet.**



## **SORT #1**

### **Sort Conditions**

The first sort was conducted April 8th through the 12th. The sort facility was set up on a grassy area next to the administrative building, approximately 500 yards from the tipping area. The samples were transported to and from the facility by trailer. Weather conditions were mild and sunny.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	2,017,600
<b>Total Sample Weight (lbs)</b>	3,470.7
<b>Significance Test Results</b>	.000
<b>Number of Samples</b>	16

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	8	<b>Beauty/Hygiene Aerosol Products</b>	2
<b>Prescription Medication (Rx)</b>	5	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	15	<b>Gardening/Yard Care Products</b>	1
<b>Household Cleaning Products</b>	5	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	3	<b>Disposable Razors</b>	40
<b>Syringes</b>	10	<b>Alkaline Batteries</b>	33
<b>Hardware/Shop Products</b>	32	<b>Automobile Maintenance/Cleaning Products</b>	1
<b>Aerosol Cans</b>	5		
<b>Miscellaneous items:</b> 1 package of moth balls, 3 battery packs, 1 intravenous nutrition supply, 1 container of shoe polish, 1 lighter			



# LAMAR SORT #1

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	220	49.8	80%	20%	drop-off	Carthage & Joplin
2	243	48.9	90%	10%	curbside/drop-off	Lamar
3	167	52	50%	50%	curbside/drop-off	Lamar
4	283	63.4	100%	0%	none	Granby
5	191.1	43.8	50%	50%	curbside/drop-off	Lamar
6	237.1	47.4	0%	100%	drop-off	Neosho
7	230	50.3	50%	50%	none	McDonald Co.
8	246	47.1	50%	50%	drop-off	Neosho
9	221	49.9	75%	25%	none	Goodman
10	239	49.4	50%	50%	curbside/drop-off	Lamar
11	148	40.2	50%	50%	curbside/drop-off	Lamar
12	268	57.7	85%	15%	none	Seneca
13	193.5	45.8	90%	10%	curbside/drop-off	Lamar
14	197	41.3	90%	10%	curbside/drop-off	Lamar
15	161.5	46	50%	50%	curbside/drop-off	Lamar
16	225.5	49.8	50%	50%	curbside/drop-off	Lamar
<b>TOTALS</b>	<b>3470.7</b>	<b>782.8</b>				
<b>AVERAGE</b>	<b>216.9</b>	<b>48.9</b>	<b>63%</b>	<b>36%</b>		

TABLE 12-1

CATEGORY	LAMAR				SORT # 1	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	240.7	100.6	15.0	6.3	6.94%	12.84%
Newsprint	205.6	37.3	12.9	2.3	5.93%	4.76%
Magazines	103.5	10.5	6.5	0.7	2.98%	1.33%
High Grade	63.0	18.4	3.9	1.2	1.82%	2.35%
Mixed	557.1	139.5	34.8	8.7	16.06%	17.81%
<b>PAPER TOTALS</b>	<b>1169.9</b>	<b>306.2</b>	<b>73.1</b>	<b>19.1</b>	<b>33.73%</b>	<b>39.09%</b>
Clear	89.0	7.7	5.6	0.5	2.57%	0.98%
Brown	48.0	4.2	3.0	0.3	1.38%	0.53%
Green	13.5	1.3	0.8	0.1	0.39%	0.17%
Other	22.0	2.5	1.4	0.2	0.63%	0.32%
<b>GLASS TOTALS</b>	<b>172.5</b>	<b>15.7</b>	<b>10.8</b>	<b>1.0</b>	<b>4.97%</b>	<b>2.00%</b>
Alum. Cans	38.0	15.5	2.4	1.0	1.10%	1.98%
Other Alum	25.0	11.0	1.6	0.7	0.72%	1.40%
Non ferrous	8.5	0.8	0.5	0.1	0.25%	0.10%
Food Cans	102.2	21.2	6.4	1.3	2.95%	2.70%
Ferrous	56.5	5.5	3.5	0.3	1.63%	0.70%
Oil Filters	6.0	0.5	0.4	0.0	0.17%	0.06%
<b>METAL TOTALS</b>	<b>236.2</b>	<b>54.5</b>	<b>14.8</b>	<b>3.4</b>	<b>6.81%</b>	<b>6.95%</b>
PET # 1	69.0	43.3	4.3	2.7	1.99%	5.52%
HDPE # 2	78.2	48.3	4.9	3.0	2.25%	6.16%
Film	136.3	63.8	8.5	4.0	3.93%	8.15%
Other Plastic	286.5	99.0	17.9	6.2	8.26%	12.64%
<b>PLASTIC TOTALS</b>	<b>570.0</b>	<b>254.3</b>	<b>35.6</b>	<b>15.9</b>	<b>16.43%</b>	<b>32.47%</b>
Food Waste	610.5	48.5	38.2	3.0	17.60%	6.19%
Wood Waste	14.5	1.8	0.9	0.1	0.42%	0.23%
Textiles	212.6	37.5	13.3	2.3	6.13%	4.79%
Diapers	176.0	18.8	11.0	1.2	5.07%	2.39%
Other Organics	126.3	24.2	7.9	1.5	3.64%	3.09%
<b>ORGANIC TOTALS</b>	<b>1139.9</b>	<b>130.8</b>	<b>71.2</b>	<b>8.2</b>	<b>32.86%</b>	<b>16.69%</b>
Fines	118.5	13.0	7.4	0.8	3.42%	1.66%
Other Inorganics	61.5	8.9	3.8	0.6	1.77%	1.14%
<b>INORGANIC TOTALS</b>	<b>180.0</b>	<b>21.9</b>	<b>11.3</b>	<b>1.4</b>	<b>5.19%</b>	<b>2.80%</b>
<b>GRAND TOTAL</b>	<b>3468.5</b>	<b>783.2</b>	<b>216.8</b>	<b>49.0</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 12-2





## **SORT # 2**

### **Sort Conditions**

The second sort was conducted July 15th through the 17th. The sort facility was set up approximately in the same location as the first sort. Weather conditions were sunny and very warm.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	2,017,600
Total Sample Weight (lbs)	2616.7
Significance Test Results	.000
Number of Samples	12

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	23	Beauty/Hygiene Aerosol Products	2
Prescription Medication (Rx)	6	Household Cleaning Aerosol Products	1
Beauty/Hygiene Products	3	Gardening/Yard Care Products	0
Household Cleaning Products	4	Pet Groom Products	0
Sharps/Blades	1	Disposable Razors	7
Syringes	0	Alkaline Batteries	26
Hardware/Shop Products	1	Automobile Maintenance/Cleaning Products	5
Aerosol Cans	5		
Miscellaneous items: 1 freezer pack, 1 container of lighter fluid, 1 package of fireworks.			



# LAMAR SORT # 2

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	201	38.2	80%	20%	curbside/drop-off	Lamar
2	156	25.2	50%	50%	curbside/drop-off	Monet
3	232	47.7	95%	5%	none	Carthage
4	197.5	67.4	50%	50%	curbside/drop-off	Lamar
5	219	42.7	50%	50%	curbside/drop-off	Lamar
6	225.7	59.8	50%	50%	curbside/drop-off	Lamar
7	233	53.7	50%	50%	curbside/drop-off	Lamar
8	174	32.4	50%	50%	curbside/drop-off	Monet
9	243	54.3	50%	50%	curbside/drop-off	Lamar
10	258	54.6	50%	50%	curbside/drop-off	Lamar
11	259	50.9	50%	50%	curbside/drop-off	Lamar
12	218.5	49.8	50%	50%	curbside/drop-off	Oneida
<b>TOTALS</b>	<b>2616.7</b>	<b>576.7</b>				
<b>AVERAGE</b>	<b>218.1</b>	<b>48.1</b>	<b>56%</b>	<b>44%</b>		

TABLR 12-3

	LAMAR				SORT # 2	
	TOTALS		AVERAGE			
CATEGORY	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	185.0	75.7	15.4	6.3	7.08%	13.13%
Newsprint	132.0	20.3	11.0	1.7	5.05%	3.52%
Magazines	135.0	12.2	11.3	1.0	5.16%	2.12%
High Grade	72.5	11.1	6.0	0.9	2.77%	1.92%
Mixed	407.0	113.7	33.9	9.5	15.57%	19.72%
PAPER TOTALS	931.5	233.0	77.6	19.4	35.62%	40.40%
Clear	87.0	8.1	7.3	0.7	3.33%	1.40%
Brown	12.0	1.4	1.0	0.1	0.46%	0.24%
Green	1.0	0.3	0.1	0.0	0.04%	0.05%
Other	18.0	1.6	1.5	0.1	0.69%	0.28%
GLASS TOTALS	118.0	11.4	9.8	1.0	4.51%	1.98%
Alum. Cans	46.5	8.9	3.9	0.7	1.78%	1.54%
Other Alum	24.5	2.4	2.0	0.2	0.94%	0.42%
Non ferrous	13.0	1.7	1.1	0.1	0.50%	0.29%
Food Cans	84.0	15.2	7.0	1.3	3.21%	2.64%
Ferrous	23.1	2.4	1.9	0.2	0.88%	0.42%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
METAL TOTALS	191.1	30.6	15.9	2.6	7.31%	5.31%
PET # 1	68.0	29.9	5.7	2.5	2.60%	5.18%
HDPE # 2	70.0	33.2	5.8	2.8	2.68%	5.76%
Film	81.0	37.0	6.8	3.1	3.10%	6.42%
Other Plastic	181.7	78.1	15.1	6.5	6.95%	13.54%
PLASTIC TOTALS	400.7	178.2	33.4	14.9	15.32%	30.90%
Food Waste	487.0	46.1	40.6	3.8	18.62%	7.99%
Wood Waste	17.0	2.1	1.4	0.2	0.65%	0.36%
Textiles	146.0	25.8	12.2	2.2	5.58%	4.47%
Diapers	121.0	11.2	10.1	0.9	4.63%	1.94%
Other Organics	105.5	27.0	8.8	2.3	4.03%	4.68%
ORGANIC TOTALS	876.5	112.2	73.0	9.4	33.52%	19.46%
Fines	64.0	9.3	5.3	0.8	2.45%	1.61%
Other Inorganics	33.0	2.0	2.8	0.2	1.26%	0.35%
INORGANIC TOTALS	97.0	11.3	8.1	0.9	3.71%	1.96%
GRAND TOTAL	2614.8	576.7	217.9	48.1	100.00%	100.00%

TABLE 12-4





### **SORT # 3**

#### **Sort Conditions**

The third sort was conducted November 11th and 12th. The sort facility was set in the same location as Sort # 2. Weather conditions were overcast, windy, and cool. Only 10 samples were collected due to weather conditions.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	2,017,600
Total Sample Weight (lbs)	1,976.1
Significance Test Results	.000
Number of Samples	10

OTHER WASTE CATEGORIES			
Over-the-Counter Medication (OTC)	0	Beauty/Hygiene Aerosol Products	0
Prescription Medication (Rx)	1	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	3	Gardening/Yard Care Products	0
Household Cleaning Products	0	Pet Groom Products	0
Sharps/Blades	0	Disposable Razors	9
Syringes	5	Alkaline Batteries	2
Hardware/Shop Products	0	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	1		
Miscellaneous items: None.			



# **LAMAR**

## **SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	195	37.2	50%	50%	Curbside/Drop-off	Lamar (rural)
2	202	42.5	70%	30%	None	Pierce City
3	189	39.2	50%	50%	Curbside/Drop-off	Lamar (rural)
4	179	46.2	100%	0%	Curbside/Drop-off	Lamar (city)
5	186.6	35.8	50%	50%	Curbside/Drop-off	Lamar (rural)
6	223.5	49.2	0%	100%	Curbside/Drop-off	Lamar
7	157	36.8	0%	100%	Curbside/Drop-off	Lamar
8	232	46.4	50%	50%	None	Nevada
9	233	34.4	100%	0%	None	Rich Hill
10	179	46.1	90%	10%	None	Lockwood (rural)
<b>TOTALS</b>	<b>1976.1</b>	<b>413.8</b>				
<b>AVERAGE</b>	<b>197.6</b>	<b>41.4</b>	<b>56%</b>	<b>44%</b>		

TABLE 12-5

CATEGORY	LAMAR				SORT # 3	
	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	136.5	48.7	13.7	4.9	6.91%	11.77%
Newsprint	149.0	23.5	14.9	2.4	7.54%	5.68%
Magazines	102.0	8.0	10.2	0.8	5.16%	1.93%
High Grade	51.5	10.1	5.2	1.0	2.61%	2.44%
Mixed	295.5	80.5	29.6	8.1	14.95%	19.45%
<b>PAPER TOTALS</b>	<b>734.5</b>	<b>170.8</b>	<b>73.5</b>	<b>17.1</b>	<b>37.17%</b>	<b>41.28%</b>
Clear	69.0	5.2	6.9	0.5	3.49%	1.26%
Brown	20.5	1.9	2.1	0.2	1.04%	0.46%
Green	6.5	0.5	0.7	0.1	0.33%	0.12%
Other	10.3	1.3	1.0	0.1	0.52%	0.31%
<b>GLASS TOTALS</b>	<b>106.3</b>	<b>8.9</b>	<b>10.6</b>	<b>0.9</b>	<b>5.38%</b>	<b>2.15%</b>
Alum. Cans	20.5	6.9	2.1	0.7	1.04%	1.67%
Other Alum	14.5	4.1	1.5	0.4	0.73%	0.99%
Non ferrous	13.0	1.4	1.3	0.1	0.66%	0.34%
Food Cans	85.0	14.2	8.5	1.4	4.30%	3.43%
Ferrous	13.0	1.2	1.3	0.1	0.66%	0.29%
Oil Filters	3.0	0.5	0.3	0.1	0.15%	0.12%
<b>METAL TOTALS</b>	<b>149.0</b>	<b>28.3</b>	<b>14.9</b>	<b>2.8</b>	<b>7.54%</b>	<b>6.84%</b>
PET # 1	34.5	14.0	3.5	1.4	1.75%	3.38%
HDPE # 2	53.5	24.0	5.4	2.4	2.71%	5.80%
Film	55.5	27.0	5.6	2.7	2.81%	6.52%
Other Plastic	135.0	71.5	13.5	7.2	6.83%	17.28%
<b>PLASTIC TOTALS</b>	<b>278.5</b>	<b>136.5</b>	<b>27.9</b>	<b>13.7</b>	<b>14.09%</b>	<b>32.99%</b>
Food Waste	479.5	38.8	48.0	3.9	24.27%	9.38%
Wood Waste	7.7	0.8	0.8	0.1	0.39%	0.19%
Textiles	62.5	10.1	6.3	1.0	3.16%	2.44%
Diapers	52.0	4.7	5.2	0.5	2.63%	1.14%
Other Organics	43.0	5.6	4.3	0.6	2.18%	1.35%
<b>ORGANIC TOTALS</b>	<b>644.7</b>	<b>60.0</b>	<b>64.5</b>	<b>6.0</b>	<b>32.63%</b>	<b>14.50%</b>
Fines	31.5	5.2	3.2	0.5	1.59%	1.26%
Other Inorganics	31.5	4.1	3.2	0.4	1.59%	0.99%
<b>INORGANIC TOTALS</b>	<b>63.0</b>	<b>9.3</b>	<b>6.3</b>	<b>0.9</b>	<b>3.19%</b>	<b>2.25%</b>
<b>GRAND TOTAL</b>	<b>1976.0</b>	<b>413.8</b>	<b>197.6</b>	<b>41.4</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 12-6



## **SORT SUMMARY**

### **Seasonal variations**

- The percentage of food waste was higher during the third sort. Several samples included restaurant waste.
- The percentage of magazines were higher during the second sort. Two samples contained large amounts of old magazines.

### **Sort results**

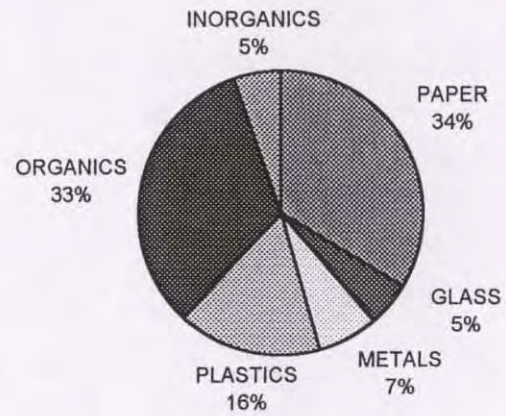
- Chart 12-1 graphically compares the three seasonal waste sort results and shows the average waste composition, by major category, for Lamar.
- The sample data for all Lamar sorts is listed on table 12-7.
- The sort results for all Lamar sorts are listed on table 12-8.
- The summary of statistical relevance for the Lamar sorts is located on page 194.
- The total for all “other wastes” found during the Lamar sorts is on page 194.

**All weights are in pounds and volumes are listed in cubic feet.**

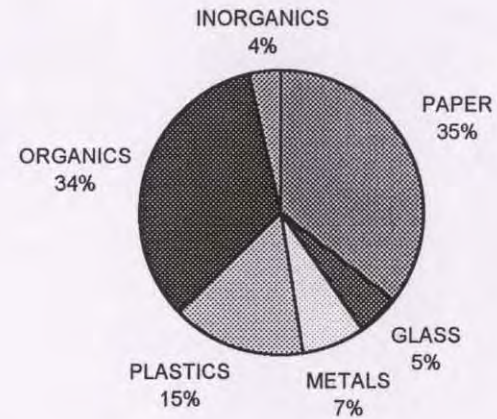
Comparisons of the Clinton waste stream to previous studies and other communities can be found in chapter 13.

## LAMAR RESULTS BY WEIGHT

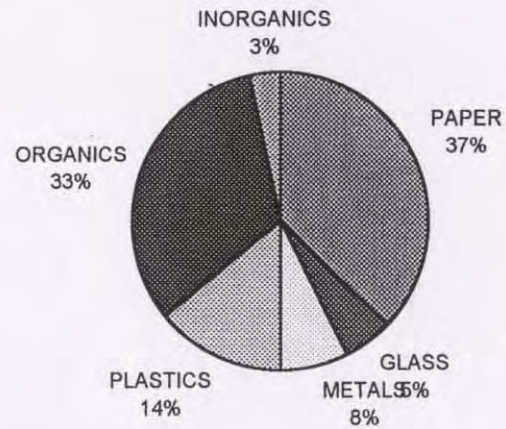
**SORT #1**



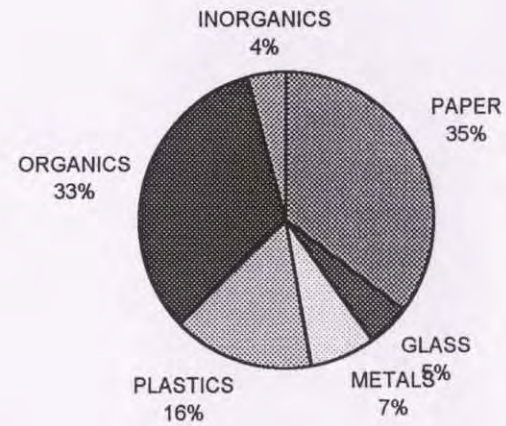
**SORT #2**



**SORT #3**



**SORT AVERAGE**





# LAMAR

## SAMPLE SUMMARY

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	4/8-4/10	16	3471.0	783.0	47%	53%
2	7/15-7/17	12	2617.0	577.0	56%	44%
3	11/11-11/13	10	1976.1	413.8	56%	44%
<b>TOTALS</b>		<b>38.0</b>	<b>8064.1</b>	<b>1773.8</b>		
<b>AVERAGE</b>		<b>12.7</b>	<b>2688.0</b>	<b>591.3</b>	<b>53%</b>	<b>47%</b>

TABLE 12-7

CATEGORY	LAMAR						SUMMARY	
	SORT # 1		SORT # 2		SORT #3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	6.9%	12.8%	7.1%	13.1%	6.9%	11.8%	7.0%	12.7%
Newsprint	5.9%	4.8%	5.0%	3.5%	7.5%	5.7%	6.0%	4.6%
Magazines	3.0%	1.3%	5.2%	2.1%	5.2%	1.9%	4.2%	1.7%
High Grade	1.8%	2.3%	2.8%	1.9%	2.6%	2.4%	2.3%	2.2%
Mixed	16.1%	17.8%	15.6%	19.7%	15.0%	19.5%	15.6%	18.8%
<b>PAPER TOTALS</b>	<b>33.7%</b>	<b>39.1%</b>	<b>35.6%</b>	<b>40.4%</b>	<b>37.2%</b>	<b>41.3%</b>	<b>35.2%</b>	<b>40.0%</b>
Clear	2.6%	1.0%	3.3%	1.4%	3.5%	1.3%	3.0%	1.2%
Brown	1.4%	0.5%	0.5%	0.2%	1.0%	0.5%	1.0%	0.4%
Green	0.4%	0.2%	0.0%	0.1%	0.3%	0.1%	0.3%	0.1%
Other	0.6%	0.3%	0.7%	0.3%	0.5%	0.3%	0.6%	0.3%
<b>GLASS TOTALS</b>	<b>5.0%</b>	<b>2.0%</b>	<b>4.5%</b>	<b>2.0%</b>	<b>5.4%</b>	<b>2.2%</b>	<b>4.9%</b>	<b>2.0%</b>
Alum. Cans	1.1%	2.0%	1.8%	1.5%	1.0%	1.7%	1.3%	1.8%
Other Alum	0.7%	1.4%	0.9%	0.4%	0.7%	1.0%	0.8%	1.0%
Non ferrous	0.2%	0.1%	0.5%	0.3%	0.7%	0.3%	0.4%	0.2%
Food Cans	2.9%	2.7%	3.2%	2.6%	4.3%	3.4%	3.4%	2.9%
Ferrous	1.6%	0.7%	0.9%	0.4%	0.7%	0.3%	1.1%	0.5%
Oil Filters	0.2%	0.1%	0.0%	0.0%	0.2%	0.1%	0.1%	0.1%
<b>METAL TOTALS</b>	<b>6.8%</b>	<b>7.0%</b>	<b>7.3%</b>	<b>5.3%</b>	<b>7.5%</b>	<b>6.8%</b>	<b>7.2%</b>	<b>6.4%</b>
PET # 1	2.0%	5.5%	2.6%	5.2%	1.7%	3.4%	2.1%	4.9%
HDPE # 2	2.3%	6.2%	2.7%	5.8%	2.7%	5.8%	2.5%	5.9%
Film	3.9%	8.1%	3.1%	6.4%	2.8%	6.5%	3.4%	7.2%
Other Plastic	8.3%	12.6%	6.9%	13.5%	6.8%	17.3%	7.5%	14.0%
<b>PLASTIC TOTALS</b>	<b>16.4%</b>	<b>32.5%</b>	<b>15.3%</b>	<b>30.9%</b>	<b>14.1%</b>	<b>33.0%</b>	<b>15.5%</b>	<b>32.1%</b>
Food Waste	17.6%	6.2%	18.6%	8.0%	24.3%	9.4%	19.6%	7.5%
Wood Waste	0.4%	0.2%	0.7%	0.4%	0.4%	0.2%	0.5%	0.3%
Textiles	6.1%	4.8%	5.6%	4.5%	3.2%	2.4%	5.2%	4.1%
Diapers	5.1%	2.4%	4.6%	1.9%	2.6%	1.1%	4.3%	2.0%
Other Organics	3.6%	3.1%	4.0%	4.7%	2.2%	1.4%	3.4%	3.2%
<b>ORGANIC TOTALS</b>	<b>32.9%</b>	<b>16.7%</b>	<b>33.5%</b>	<b>19.5%</b>	<b>32.6%</b>	<b>14.5%</b>	<b>33.0%</b>	<b>17.1%</b>
Fines	3.4%	1.7%	2.4%	1.6%	1.6%	1.3%	2.7%	1.6%
Other Inorganics	1.8%	1.1%	1.3%	0.3%	1.6%	1.0%	1.6%	0.8%
<b>INORGANIC TOTALS</b>	<b>5.2%</b>	<b>2.8%</b>	<b>3.7%</b>	<b>2.0%</b>	<b>3.2%</b>	<b>2.2%</b>	<b>4.2%</b>	<b>2.4%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 12-8



Lamar Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	6,000,000
Total Sample Weight (lbs)	8,062.8
Total Number of Samples Collected	38
Significance Test Results	.000
Mean Sample (lbs) and Confidence Interval (95%)	212.2 (+/-) 10.95

Lamar "Other Waste" Summary			
Over-the-Counter Medication (OTC)	31	Beauty/Hygiene Aerosol Products	4
Prescription Medication (Rx)	12	Household Cleaning Aerosol Products	1
Beauty/Hygiene Products	21	Gardening/Yard Care Products	1
Household Cleaning Products	9	Pet Groom Products	0
Sharps/Blades	4	Disposable Razors	56
Syringes	5	Alkaline Batteries	61
Hardware/Shop Products	33	Automobile Maintenance/Cleaning Products	6
Aerosol Cans	11		
<b>Miscellaneous items:</b> 1 freezer pack, 1 container of lighter fluid, 1 package of fireworks, 1 package of moth balls, 3 battery packs, 1 intravenous nutrition supply, 1 container of shoe polish, 1 lighter.			

## Chapter 13: Summary

Phase I of the *Missouri Waste Composition Study* examined municipal solid waste (MSW) during three seasonal waste sorts at ten landfills and transfer stations throughout the state of Missouri. The summary findings of these waste sorts are reported below.

### Sampling information

Samples of MSW were taken from licensed waste haulers at ten landfills and transfer stations throughout Missouri. These samples consisted of 20-25 bags of residential and light commercial “trash”. The waste haulers were selected at random and served only residential and commercial accounts. The waste haulers estimated the commercial/residential mix of their load and the percentage of each was entered onto the sample data sheet. No construction and demolition wastes, sewage sludge, combustion ash, or industrial process waste was sampled.

During Phase I, 350 samples were selected and the materials sorted into 26 sub-categories. These categories are defined in Chapter 2. After the sample was completely sorted and placed into the appropriate containers they were weighed, volumes estimated, and the data recorded.

The average sample size was 219 pounds by weight and 48 cubic feet by volume. The total weight of the samples was 76,750 pounds, and the volume was 16,728 cubic feet.

Table 13-1 indicates the number of samples examined at each location, the weight and volume of those samples, and an estimated composition of the sample.



# MISSOURI WASTE COMPOSITION STUDY

## PHASE I

### SAMPLE SUMMARY

Location	Number of Samples	Sample Size		Composition	
		Weight	Volume	Residential	Commercial
Springfield	32	7,078	1,547	90%	10%
Reeds Spring	40	9,282	2,032	43%	57%
Pemiscot County	40	8,342	1,831	81%	19%
St. Francois County	39	8,854	1,877	87%	13%
St. Louis	40	7,149	1,642	100%	0%
Macon	24	5,786	1,199	70%	30%
Maryville	34	7,368	1,854	98%	2%
Lee's Summit	35	8,486	1,640	86%	14%
Clinton	28	6,342	1,331	71%	29%
Lamar	38	8,064	1,774	53%	47%
<b>Total</b>	<b>350</b>	<b>76,750</b>	<b>16,728</b>	<b>80%</b>	<b>20%</b>

TABLE 13-1

## Results by weight

Table 13-2 shows the percentage of materials, by weight, found in the MSW during the three seasonal sorts. The average is based on the total weight of that material for all three sorts, divided by the total weight sorted. A description of each category is listed in Chapter 2. Chart 13-1 represents the same information in four pie charts.

The results were fairly consistent from one round to the next. Small fluctuations are mentioned in each location chapter (3-12). There were only two major changes from one seasonal sort to the next.

One change was in the “fines” category (small items too small to be separated efficiently). A change in sorting procedure at the end of the first round of sorts resulted in better accuracy during the second and third round of sorts. This resulted in a lower percentage of “fines” during the second and third sorts. About half of the material counted as “fines” during the first round of sorts was counted as food waste in the second and third rounds of sorts.

The second change was the increase in the “organics” category throughout the year. This was a result of additional fruit and melon rinds in the food waste, and increased yard waste and corn shucks in the “other organics” sub-category. Watermelon rinds were present from mid May through September. Yard waste is officially banned from Missouri landfills and transfer stations but small quantities of grass clippings and leaves were occasionally “smuggled in” and found in sealed bags. Corn shucks increased significantly during the summer months. Both yard waste and corn shucks were put into the “other organics” sub-category.



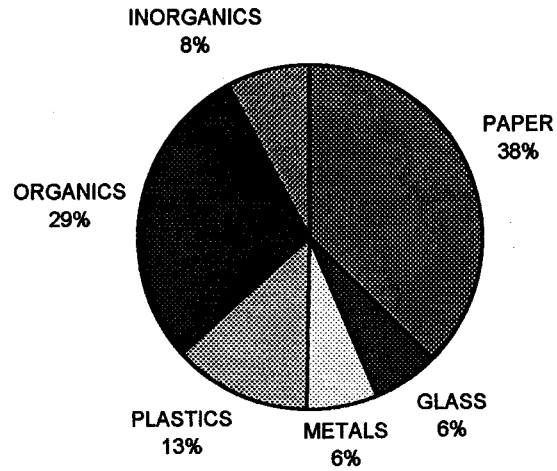
## PHASE I SUMMARY RESULTS BY WEIGHT

	SORT # 1	SORT # 2	SORT #3	AVERAGE
	2/5/96-4/10/96	5/13/96-7/17/96	9/3/96-11/13/96	2/5/96-11/13/96
CATEGORY	WT.	WT.	WT.	WT.
Cardboard	6.6%	6.2%	6.5%	6.4%
Newsprint	7.6%	7.6%	8.3%	7.8%
Magazines	3.2%	3.4%	3.8%	3.5%
High Grade	2.1%	3.2%	3.6%	2.9%
Mixed	18.1%	16.3%	14.0%	16.2%
PAPER TOTALS	37.6%	36.6%	36.1%	36.8%
Clear	3.6%	3.3%	3.1%	3.3%
Brown	1.6%	1.6%	1.8%	1.7%
Green	0.4%	0.4%	0.4%	0.4%
Other	0.5%	0.8%	0.7%	0.7%
GLASS TOTALS	6.1%	6.0%	6.1%	6.1%
Alum. Cans	1.2%	1.7%	1.7%	1.5%
Other Alum	0.6%	0.9%	0.9%	0.8%
Non ferrous	0.2%	0.3%	0.3%	0.3%
Food Cans	3.2%	2.7%	3.4%	3.1%
Ferrous	1.1%	1.1%	1.3%	1.1%
Oil Filters	0.1%	0.1%	0.0%	0.1%
METAL TOTALS	6.5%	6.8%	7.6%	6.9%
PET # 1	1.5%	1.8%	1.9%	1.7%
HDPE # 2	1.9%	2.0%	2.5%	2.1%
Film	3.8%	3.6%	3.1%	3.5%
Other Plastic	6.1%	7.6%	7.3%	7.0%
PLASTIC TOTALS	13.3%	14.9%	14.9%	14.3%
Food Waste	16.4%	18.8%	19.3%	18.1%
Wood Waste	0.7%	0.8%	0.9%	0.8%
Textiles	4.1%	4.3%	4.0%	4.1%
Diapers	5.1%	3.9%	3.7%	4.3%
Other Organics	2.4%	3.5%	4.1%	3.3%
ORGANIC TOTALS	28.7%	31.4%	32.0%	30.6%
Fines	6.1%	2.6%	2.0%	3.6%
Other Inorganics	1.9%	1.7%	1.2%	1.6%
INORGANIC TOTALS	7.9%	4.3%	3.2%	5.2%
SORT TOTALS	100%	100%	100%	100%

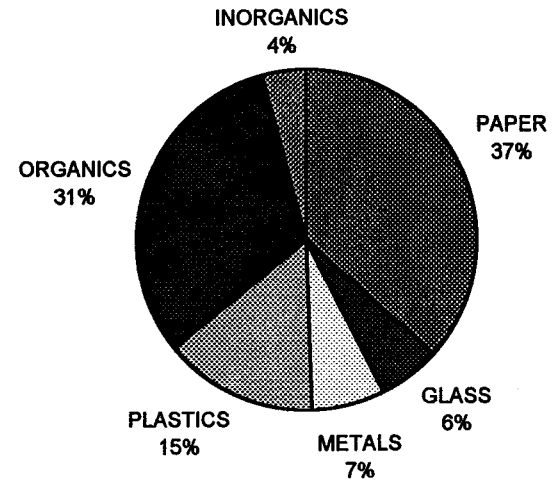
TABLE 13-2

## PHASE I SUMMARY RESULTS BY WEIGHT

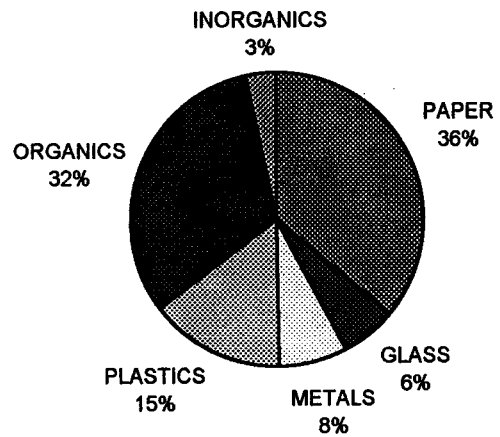
**SORT #1**



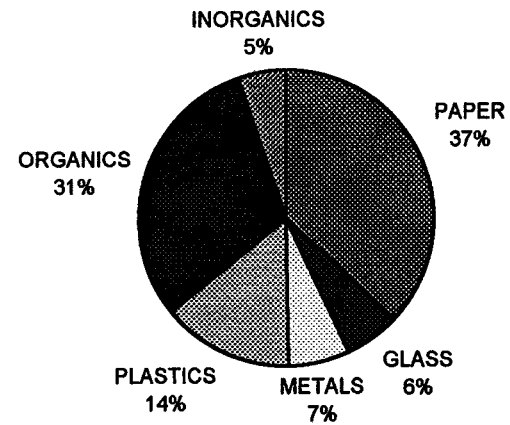
**SORT #2**



**SORT #3**



**SORT AVERAGE**





## **Comparison of waste composition among locations**

Table 13-3 lists the average composition of waste at each location. Chart 13-2 represents this information graphically for the six major categories (paper, glass, metals, plastics, organics, and inorganics). The following observations were noted during the waste sorts which may explain some of the obvious differences between sorting locations:

### **Paper**

- Reeds Spring was higher in paper waste due to the promotional literature discarded by the Branson tourists.
- St. Louis and Lee's Summit had higher percentages of newsprint due to the presence of voluminous daily newspapers (the *Kansas City Star* and the *St. Louis Post Dispatch*).
- Maryville had the lowest percentage of paper due to their aggressive recycling program. The high tipping fee at the Maryville landfill (\$56.00 per ton at the landfill but no charge to drop off recyclables at the material recovery facility) seems to be an economic incentive for waste haulers to offer curbside recycling and encourage their customers to recycle.
- Pemiscot County had higher amounts of mixed paper at each of the seasonal sorts. Large amounts of paper food plates were particularly noticeable. One local waste hauler thought this was a result of lower income homes without running water to wash dishes.

### **Glass**

- Maryville had the lowest percentage of glass probably due to their recycling program.

### **Metals**

- Maryville had the lowest percentage of aluminum and steel cans probably due to recycling.
- Clinton had the highest percentage of aluminum cans. Many of these cans came from tourist areas around the Quad lakes area during the July waste sort.

## **Plastics**

- The percentage of other plastics and plastic film (bags) were higher in Reeds Spring, especially during the second sort. Most of the samples originated in Branson and were directly related to the tourist industry (plastic drink cups and motel trash).
- Macon had a higher percentage of other plastics. This was a result of several samples from commercial generators which disposed large amounts of heavy rigid plastics.
- Maryville had the lowest percentage of PET and HDPE, probably due to recycling.

## **Organics**

- Maryville had the highest percentage of organics. The reduction in recyclables increased the organic percentage.
- The low percentage of food waste in Reeds Spring may indicate that the restaurant waste was not included during the random sample selection process.
- The high percentage of diapers in the Macon and Maryville samples is a result of nursing home waste (adult diapers).

## **Inorganics**

- Most of the other inorganic category was kitty litter.
- Maryville had a high percentage of kitty litter while the University was in session, suggesting that there may be a large number of students with pet cats.
- Lee's Summit and St. Louis also had higher percentages of kitty litter, suggesting that cats are more prevalent in urban areas.



## COMPARABLE RESULTS BY LOCATION

CATEGORY	Springfield PCT. BY WT.	Reeds Spring PCT. BY WT.	Pemiscot Co. PCT. BY WT.	St. Francois Co. PCT. BY WT.	St. Louis PCT. BY WT.
Cardboard	7.4%	7.7%	6.4%	6.9%	4.4%
Newsprint	9.5%	7.2%	5.6%	6.6%	13.3%
Magazines	2.6%	3.5%	3.7%	3.9%	3.0%
High Grade	1.8%	3.6%	2.9%	2.8%	2.8%
Mixed	18.3%	18.5%	19.0%	14.7%	13.1%
<b>PAPER TOTALS</b>	<b>39.6%</b>	<b>40.5%</b>	<b>37.6%</b>	<b>34.9%</b>	<b>36.6%</b>
Clear	3.1%	3.9%	3.7%	3.9%	3.8%
Brown	1.4%	2.1%	2.3%	1.9%	2.2%
Green	0.4%	0.5%	0.4%	0.2%	0.7%
Other	0.4%	0.5%	0.6%	0.5%	0.7%
<b>GLASS TOTALS</b>	<b>5.3%</b>	<b>7.0%</b>	<b>7.0%</b>	<b>6.5%</b>	<b>7.4%</b>
Alum. Cans	1.4%	1.8%	1.7%	1.6%	1.5%
Other Alum	0.7%	0.7%	0.9%	0.8%	0.7%
Non ferrous	0.1%	0.2%	0.2%	0.3%	0.3%
Food Cans	4.0%	2.9%	3.3%	3.9%	2.6%
Ferrous	1.1%	1.5%	0.8%	1.2%	1.2%
Oil Filters	0.1%	0.2%	0.0%	0.1%	0.0%
<b>METAL TOTALS</b>	<b>7.4%</b>	<b>7.3%</b>	<b>6.9%</b>	<b>7.9%</b>	<b>6.3%</b>
PET # 1	2.2%	2.1%	1.6%	1.8%	1.3%
HDPE # 2	2.3%	2.3%	2.2%	2.4%	1.7%
Film	4.1%	4.5%	3.7%	3.3%	2.9%
Other Plastic	5.9%	8.4%	6.4%	6.6%	6.5%
<b>PLASTIC TOTALS</b>	<b>14.5%</b>	<b>17.3%</b>	<b>13.9%</b>	<b>14.1%</b>	<b>12.4%</b>
Food Waste	16.8%	12.8%	19.8%	17.9%	18.0%
Wood Waste	1.0%	0.9%	0.4%	0.7%	0.6%
Textiles	3.7%	3.5%	3.4%	6.1%	4.1%
Diapers	3.8%	2.3%	4.0%	4.2%	3.8%
Other Organics	3.0%	2.1%	2.3%	2.7%	5.0%
<b>ORGANIC TOTALS</b>	<b>28.3%</b>	<b>21.6%</b>	<b>29.9%</b>	<b>31.6%</b>	<b>31.5%</b>
Fines	3.8%	5.0%	3.4%	4.1%	4.3%
Other Inorganics	1.3%	1.4%	1.1%	1.0%	1.8%
<b>INORGANIC TOTALS</b>	<b>5.1%</b>	<b>6.4%</b>	<b>4.5%</b>	<b>5.1%</b>	<b>6.1%</b>
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

TABLE 13-3

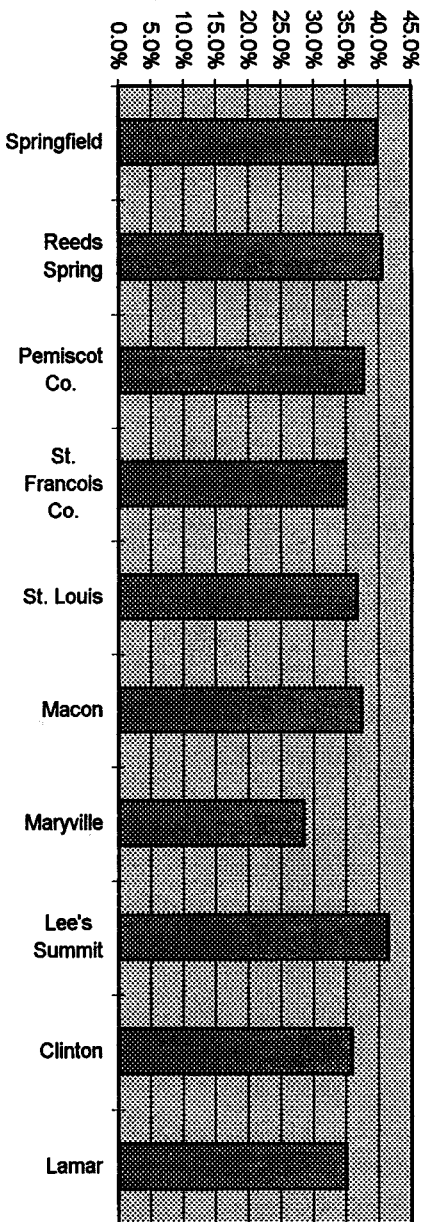
## **COMPARABLE RESULTS BY LOCATION**

<b>Macon</b>	<b>Maryville</b>	<b>Lee's Summit</b>	<b>Clinton</b>	<b>Lamar</b>	
<b>PCT. BY WT.</b>	<b>PCT. BY WT.</b>	<b>PCT. BY WT.</b>	<b>PCT. BY WT.</b>	<b>PCT. BY WT.</b>	<b>CATEGORY</b>
7.4%	4.6%	6.4%	5.5%	7.0%	<b>Cardboard</b>
5.8%	3.5%	13.1%	7.4%	6.0%	<b>Newsprint</b>
3.7%	1.7%	4.4%	3.6%	4.2%	<b>Magazines</b>
4.8%	1.4%	3.8%	3.3%	2.3%	<b>High Grade</b>
15.6%	17.3%	13.7%	16.0%	15.6%	<b>Mixed</b>
<b>37.3%</b>	<b>28.5%</b>	<b>41.4%</b>	<b>35.8%</b>	<b>35.1%</b>	<b>PAPER TOTALS</b>
2.6%	1.6%	3.0%	4.3%	3.0%	<b>Clear</b>
1.3%	1.2%	1.6%	1.7%	1.0%	<b>Brown</b>
0.4%	0.2%	0.5%	0.5%	0.3%	<b>Green</b>
0.9%	0.9%	0.8%	0.7%	0.6%	<b>Other</b>
<b>5.2%</b>	<b>3.9%</b>	<b>5.9%</b>	<b>7.2%</b>	<b>4.9%</b>	<b>GLASS TOTALS</b>
1.7%	0.6%	1.7%	2.2%	1.3%	<b>Alum. Cans</b>
0.8%	1.1%	0.8%	0.9%	0.8%	<b>Other Alum</b>
0.3%	0.3%	0.2%	0.4%	0.4%	<b>Non ferrous</b>
3.0%	1.6%	2.7%	3.5%	3.4%	<b>Food Cans</b>
1.1%	1.4%	0.9%	1.1%	1.1%	<b>Ferrous</b>
0.0%	0.1%	0.0%	0.1%	0.1%	<b>Oil Filters</b>
<b>6.9%</b>	<b>5.1%</b>	<b>6.3%</b>	<b>8.2%</b>	<b>7.1%</b>	<b>METAL TOTALS</b>
1.8%	0.9%	1.5%	2.0%	2.1%	<b>PET # 1</b>
1.9%	1.3%	2.0%	2.3%	2.5%	<b>HDPE # 2</b>
3.1%	3.4%	3.2%	3.1%	3.4%	<b>Film</b>
8.3%	8.4%	5.8%	6.2%	7.5%	<b>Other Plastic</b>
<b>15.1%</b>	<b>14.0%</b>	<b>12.5%</b>	<b>13.6%</b>	<b>15.5%</b>	<b>PLASTIC TOTALS</b>
18.0%	25.4%	15.2%	19.4%	19.6%	<b>Food Waste</b>
0.9%	0.9%	1.0%	1.1%	0.5%	<b>Wood Waste</b>
5.6%	3.3%	3.7%	2.8%	5.2%	<b>Textiles</b>
5.0%	6.6%	4.8%	4.4%	4.3%	<b>Diapers</b>
2.9%	4.7%	4.1%	3.2%	3.4%	<b>Other Organics</b>
<b>32.4%</b>	<b>40.9%</b>	<b>28.8%</b>	<b>30.9%</b>	<b>33.0%</b>	<b>ORGANIC TOTALS</b>
1.7%	4.5%	3.0%	2.9%	2.7%	<b>Fines</b>
1.4%	3.0%	2.2%	1.4%	1.6%	<b>Other Inorganics</b>
<b>3.1%</b>	<b>7.5%</b>	<b>5.2%</b>	<b>4.3%</b>	<b>4.3%</b>	<b>INORGANIC TOTALS</b>
<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>TOTAL</b>

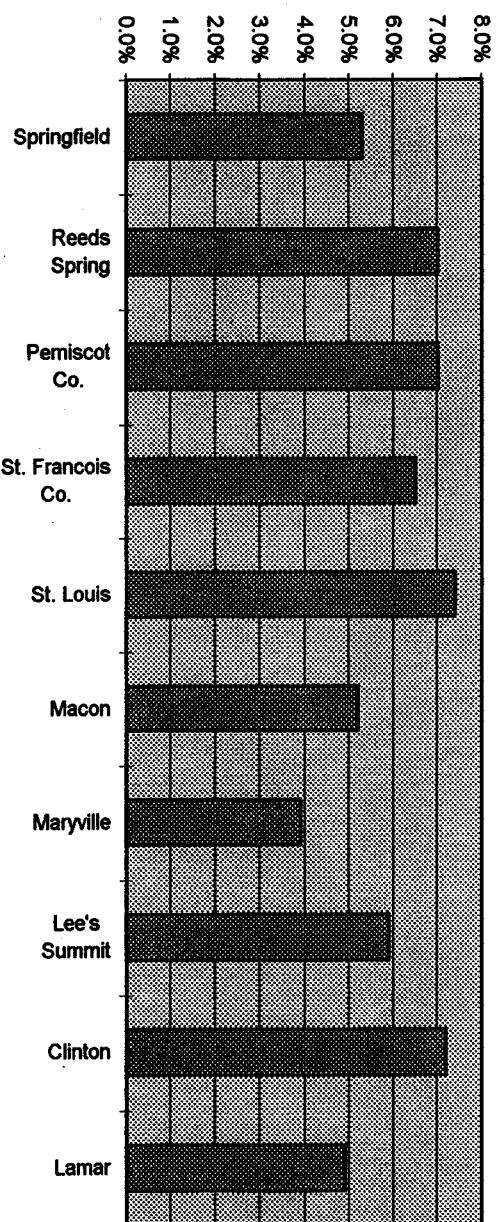


# COMPARISON OF CATEGORIES BY LOCATION

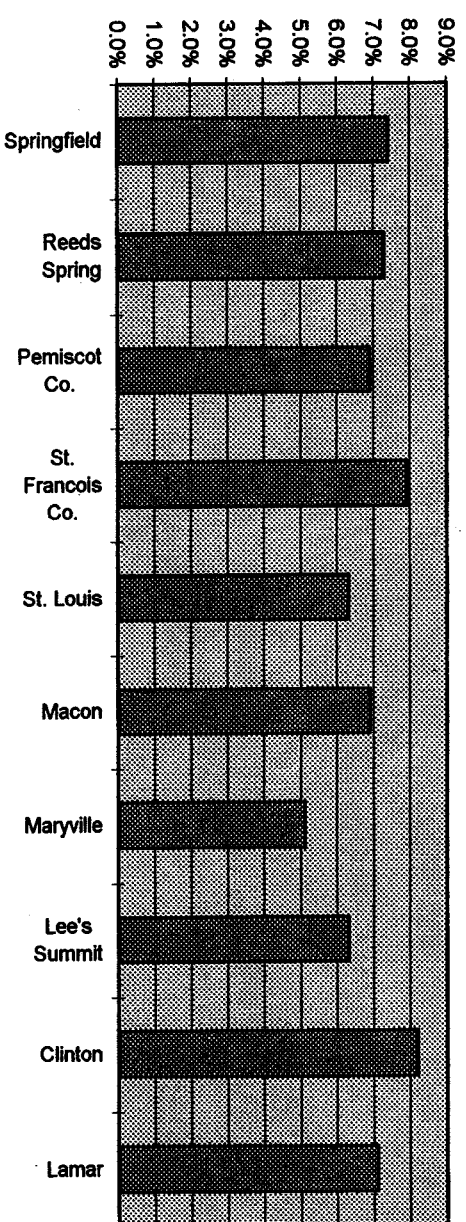
Percentage of paper by location



Percentage of glass by location



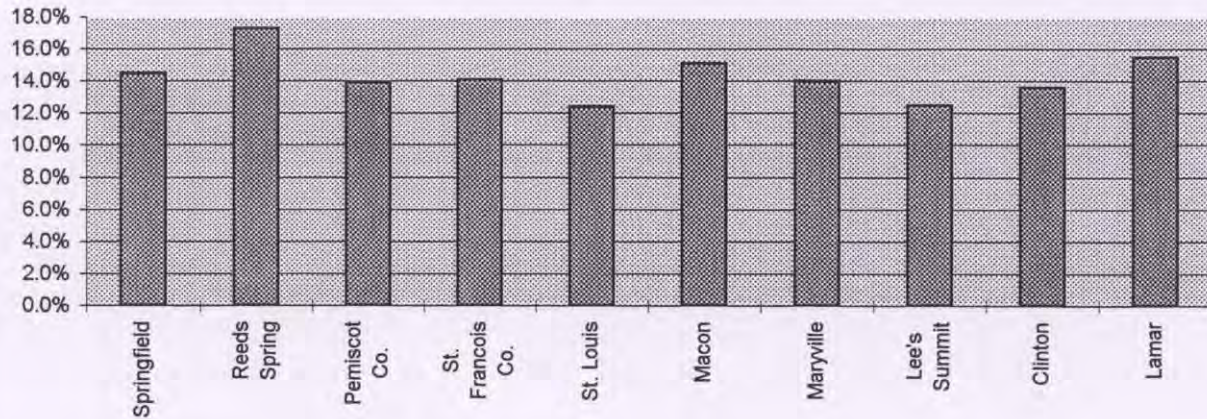
Percentage of metals by location



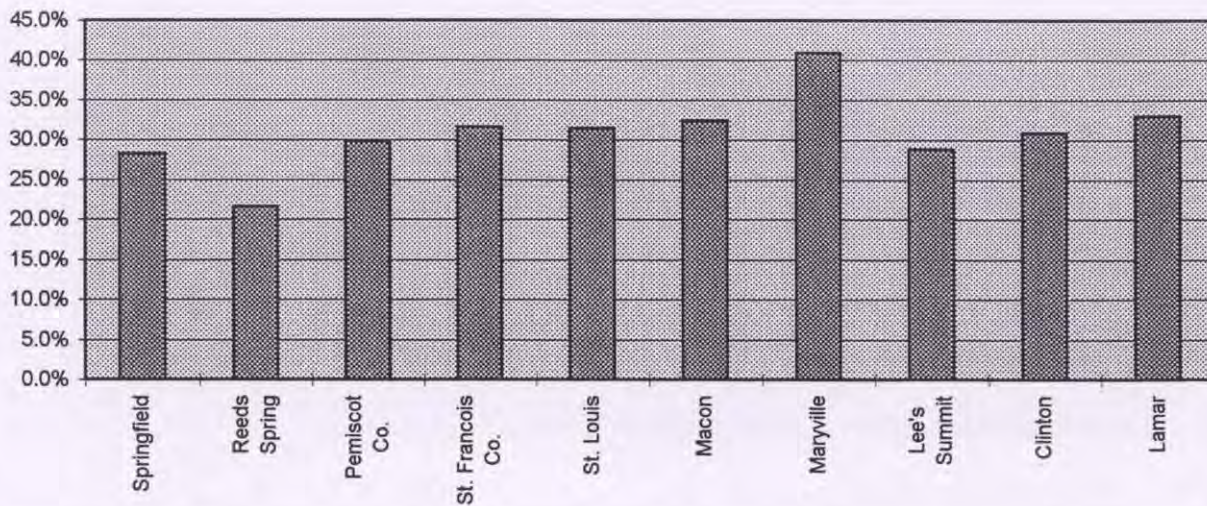


## COMPARISON OF CATEGORIES BY LOCATION

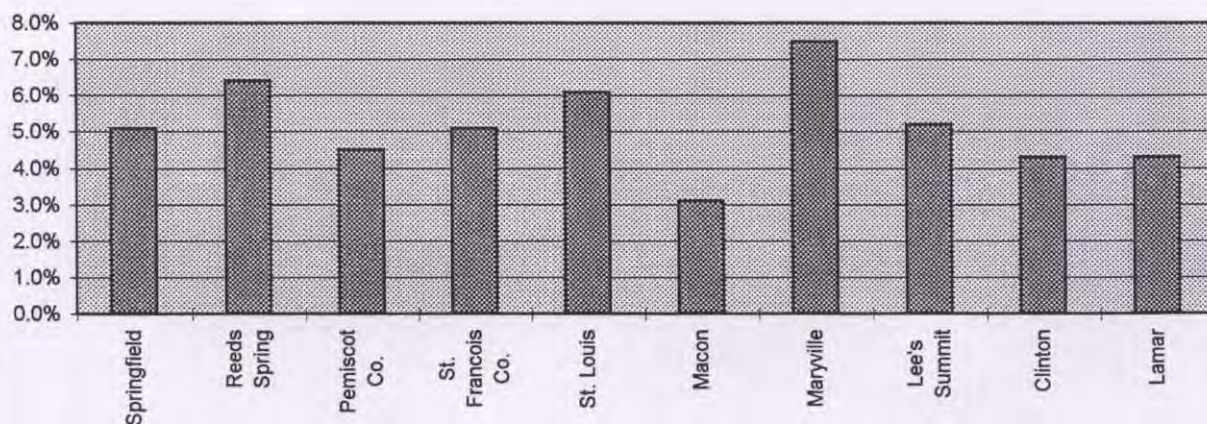
Percentage of plastic by location



Percentage of organics by location



Percentage of inorganics by location





### **Comparisons to other waste composition studies**

Several waste composition studies have been conducted during the past ten years. These studies vary greatly in the type of methodology used to gather the data. Most of these waste composition studies chose different waste categories or defined their categories differently. This difference in categories makes comparisons somewhat difficult but not impossible. In some cases sub-categories were grouped together to form the major categories for comparison. The comparisons are listed in Table 13-4 and graphically portrayed on Chart 13-3. The five waste composition studies selected for comparisons are:

#### ***The Missouri Statewide Resource Recovery Feasibility and Planning Study: EIERA 1987***

This was the first statewide waste composition study done in Missouri. Two seasonal sorts were conducted at four landfills. The waste sorts were performed before yard waste was banned in Missouri, therefore it is included in the other organics sub category. This comparison indicates how the Missouri waste stream has changed over the past nine years. Table 13-5 compares the changes in composition of waste at two landfills between 1987 and 1996.

#### ***Solid Waste Stream Assessment: Leelanau County, Michigan. 1989***

This solid waste stream assessment was conducted by Franklin and Associates in 1988. It consisted of four seasonal sorts of residential and commercial waste into categories that closely resembled the *Missouri Waste Composition Study* so comparisons were compatible. At the time the area had an emerging recycling and composting program, similar to the recycling program in Maryville. Yard waste was not banned from landfills and is included as other organics.



### ***Oregon Solid Waste Characterization and Composition 1992-93***

The study consisted of four seasonal sorts of residential and commercial waste. The waste was sorted into 83 categories, so many of those categories were combined for comparison purposes. Oregon had an extensive waste reduction and recycling program in place before, and during, the waste sorts. Yard waste was not banned from landfills and is included as other organics.

### ***The Minnesota Solid Waste Composition Study 1990-1992***

The Minnesota study was conducted by the Minnesota Pollution Control Agency. It consisted of four seasonal waste sorts conducted over a two year period. The results used on Table 13-4 are from sorts conducted in 1991-92. Samples were taken from residential and commercial waste haulers. During the year, 1,119 samples weighing 343,007 pounds were sorted. The methodology for this study was used in planning the *Missouri Waste Composition Study*.

### ***Characterization of Municipal Solid Waste in the United States: 1994 update***

This study was funded, and distributed by the Environmental Protection Agency. It is better known in solid waste circles as the "Franklin Study". The authors of the study, Franklin and Associates use the "material flows methodology" to determine the composition of solid waste. This methodology is based on production data (by weight) for the materials and products in the waste stream, with adjustments for imports, exports, and product lifetimes.

The Franklin study defined categories differently than other waste composition studies. Main divisions include durable goods, nondurable goods, containers and packaging, and other wastes. Materials can be listed in one or more of these major divisions. Every effort was made to maintain accuracy and still fit the "Franklin categories" into the categories used for comparisons.



### **Differences between the waste composition studies**

Comparisons between the different waste composition data is interesting. If we assume that the methodology used to conduct the study has provided accurate results, there seem to be two main components that effect the data. These two are banned items and recycling. The items that are banned from disposal in Missouri landfills are:

- Major appliances (white goods)
- Waste oil
- Lead-acid batteries
- Yard waste or clippings

The ban on yard waste seems to have a remarkable effect on reducing the amount of organic materials in the waste stream. The organic component in the Missouri waste stream is considerably lower than the organic materials in the other studies. The most plausible explanation seems to be the lack of yard waste.

Recycling also seems to have an effect on the composition of the waste stream. Michigan, Oregon, and Minnesota had strong recycling programs in effect during their waste sorts. The only Missouri location which has a similar recycling program is the City of Maryville. Maryville seems to be comparable to these other states in the percentage of "recyclable material" within the waste stream.

Waste sorts were conducted at two landfills (Lee's Summit and Springfield) in both the 1987 and 1996 study. The results portray how the waste stream is changing over time. Table 13-5 lists the results of the 1987 EI ERA waste sorts and the 1996 waste sorts at these landfills. Many of these changes reflect cultural and packaging changes. Cardboard and other organics (including yard waste) were higher in 1987. Newsprint, plastics, food waste and diapers were higher in 1996.

## COMPARISSON OF OTHER WASTE COMPOSITION STUDIES

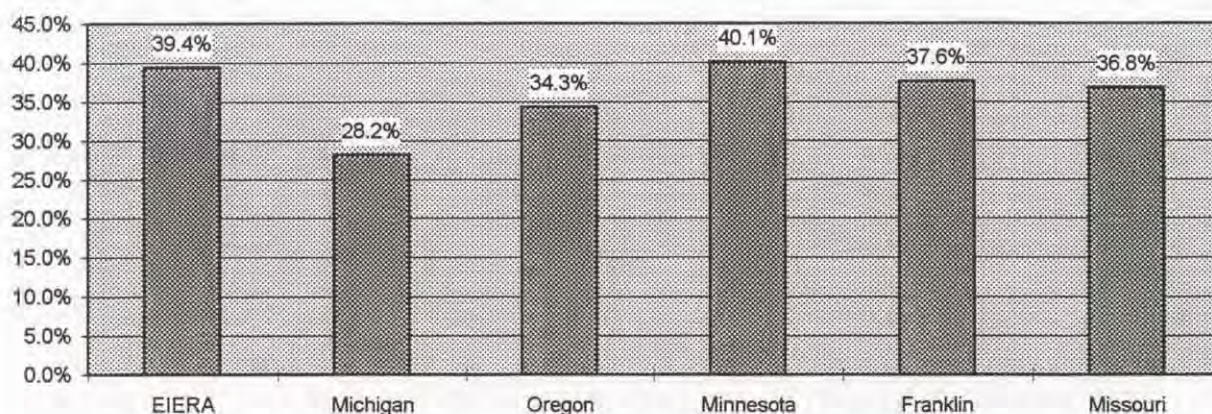
CATEGORY	1987 EIERA	1989 Michigan	1992 Oregon	1992 Minnesota	1994 Franklin	1996 Missouri
Cardboard	15.1%	16.9%	6.1%	8.7%	11.1%	6.4%
Newsprint	6.6%	6.2%	4.3%	4.0%	4.3%	7.8%
Magazines	1.7%	3.1%	2.5%	2.9%	2.2%	3.5%
High Grade	3.2%	2.0%	3.1%	4.5%	2.8%	2.9%
Mixed	12.7%	N/A	18.3%	20.0%	17.2%	16.2%
<b>PAPER TOTALS</b>	<b>39.4%</b>	<b>28.2%</b>	<b>34.3%</b>	<b>40.1%</b>	<b>37.6%</b>	<b>36.8%</b>
Clear	3.0%	N/A	3.0%	2.0%	2.5%	3.3%
Brown	0.8%	N/A	N/A	N/A	2.4%	1.7%
Green	0.7%	N/A	N/A	N/A	0.9%	0.4%
Other	N/A	N/A	0.3%	1.1%	0.8%	0.7%
<b>GLASS TOTALS</b>	<b>4.5%</b>	<b>3.9%</b>	<b>3.3%</b>	<b>3.1%</b>	<b>6.6%</b>	<b>6.1%</b>
Alum. Cans	1.0%	N/A	0.1%	0.5%	0.4%	1.5%
Other Alum	0.5%	N/A	0.2%	0.4%	0.2%	0.8%
Non ferrous	0.1%	0.8%	N/A	0.5%	N/A	0.3%
Food Cans	2.0%	N/A	2.0%	0.9%	1.0%	3.1%
Ferrous	3.5%	6.6%	3.6%	2.8%	6.7%	1.1%
Oil Filters	N/A	N/A	N/A	0.1%	N/A	0.1%
<b>METAL TOTALS</b>	<b>7.0%</b>	<b>7.4%</b>	<b>5.9%</b>	<b>5.2%</b>	<b>8.3%</b>	<b>6.9%</b>
PET # 1	0.4%	N/A	N/A	0.3%	0.2%	1.7%
HDPE # 2	0.3%	N/A	N/A	0.7%	0.3%	2.1%
Film	N/A	N/A	N/A	4.7%	1.7%	3.5%
Other Plastic	7.1%	N/A	N/A	5.9%	7.1%	7.0%
<b>PLASTIC TOTALS</b>	<b>7.7%</b>	<b>9.1%</b>	<b>7.8%</b>	<b>11.6%</b>	<b>9.3%</b>	<b>14.3%</b>
Food Waste	8.3%	9.7%	22.3%	13.2%	6.7%	18.1%
Wood Waste	N/A	5.6%	3.9%	6.6%	6.6%	0.8%
Textiles	3.9%	2.1%	2.4%	3.0%	2.4%	4.1%
Diapers	1.5%	2.0%	2.2%	2.4%	1.3%	4.3%
Other Organics	21.6%	24.9%	13.2%	11.0%	19.3%	3.3%
<b>ORGANIC TOTALS</b>	<b>35.3%</b>	<b>44.3%</b>	<b>44.0%</b>	<b>36.2%</b>	<b>36.3%</b>	<b>30.6%</b>
Fines	2.9%	5.3%	3.0%	N/A	N/A	3.6%
Other Inorganics	2.9%	1.8%	1.7%	3.8%	1.9%	1.6%
<b>INORGANIC TOTALS</b>	<b>5.8%</b>	<b>7.1%</b>	<b>4.7%</b>	<b>3.8%</b>	<b>1.9%</b>	<b>5.2%</b>
<b>TOTAL</b>	<b>99.6%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

TABLE 13-4

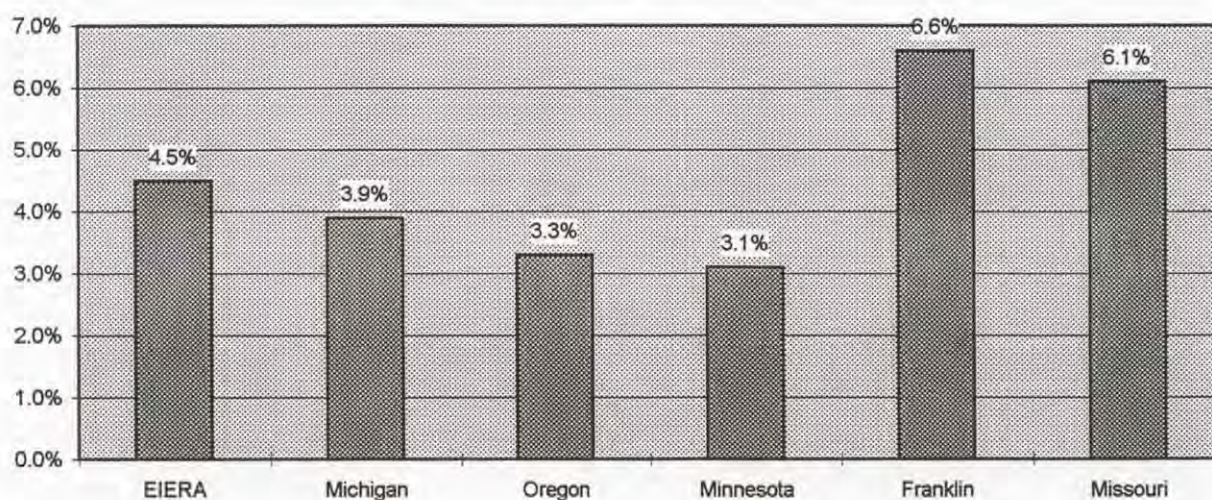


## COMPARISON OF OTHER WASTE COMPOSITION STUDIES

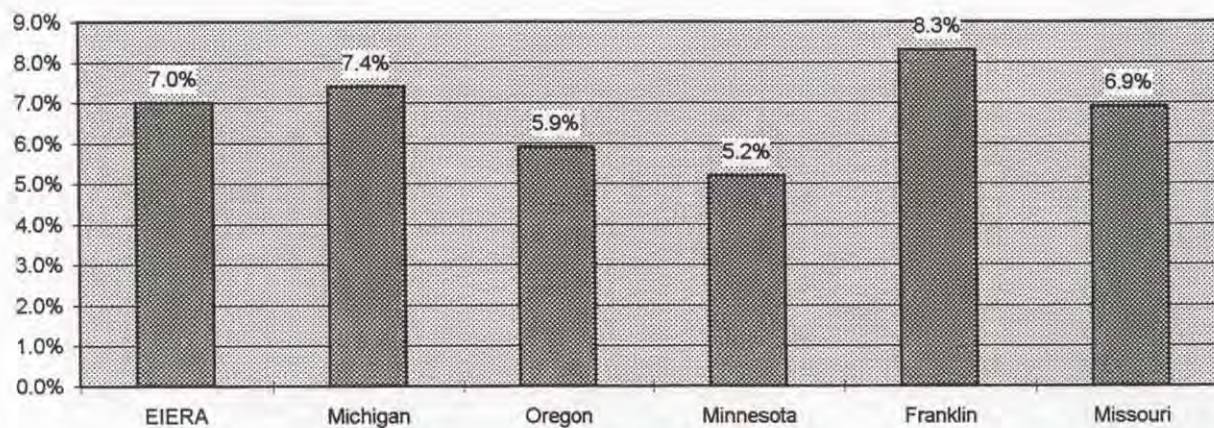
Percentage of paper in other waste composition studies



Percentage of glass in other waste composition studies



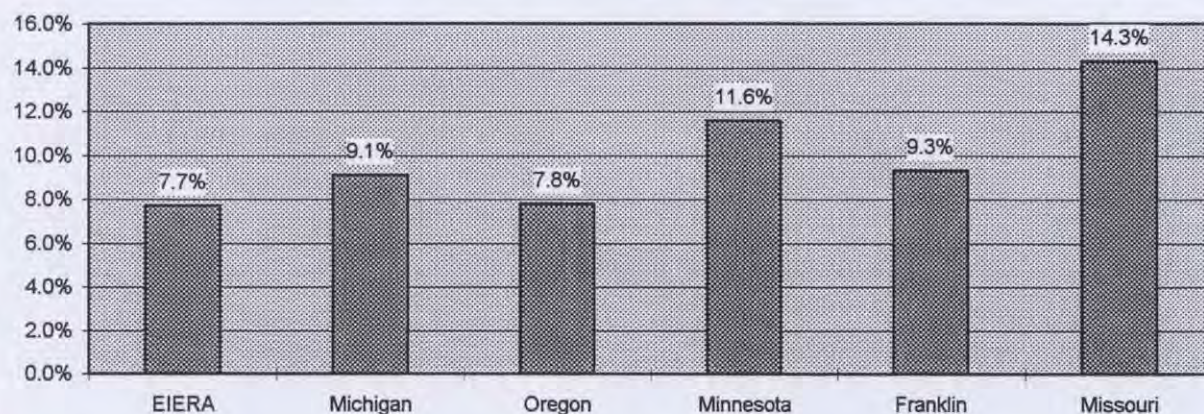
Percentage of metals in other waste composition studies



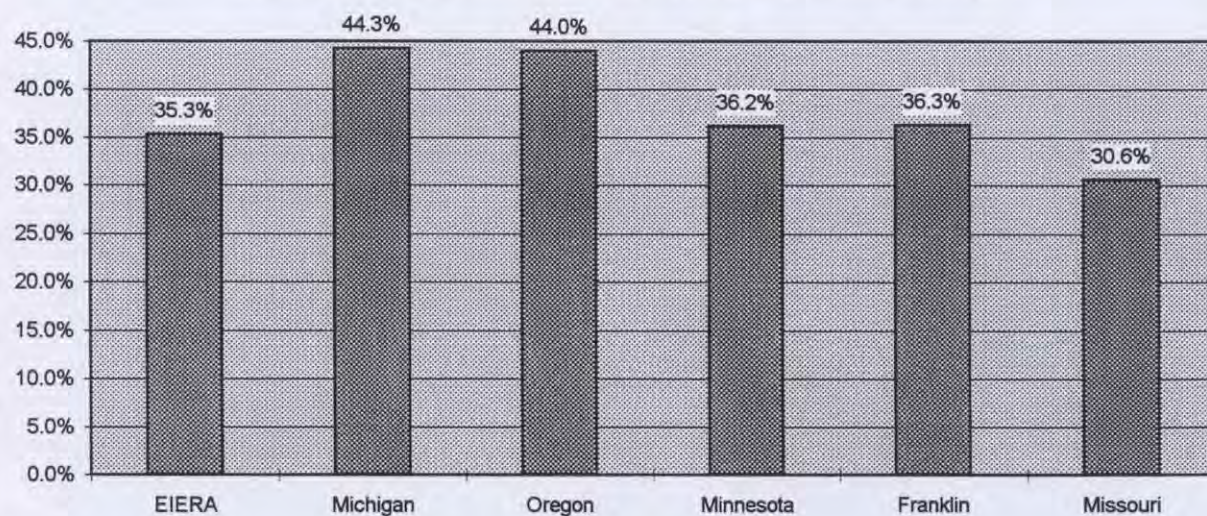


## COMPARISON OF OTHER WASTE COMPOSITION STUDIES

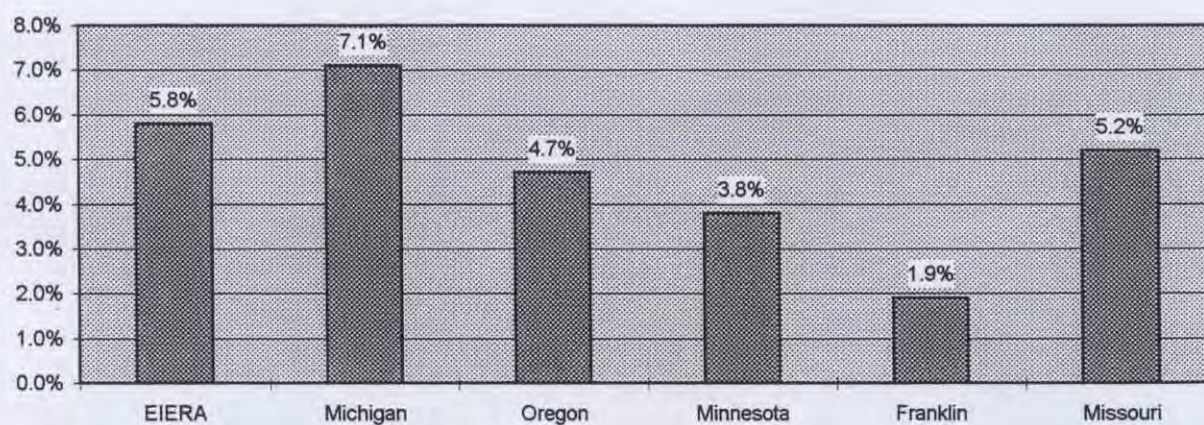
Percentage of plastics in other waste composition studies



Percentage of organics in other waste composition studies



Percentage of inorganics in other waste composition studies





## LEE'S SUMMIT AND SPRINGFIELD COMPARISONS

CATEGORY	Lee's Summit		Springfield	
	1987	1996	1987	1996
Cardboard	11.1%	6.4%	18.3%	7.4%
Newsprint	9.0%	13.1%	4.8%	9.5%
Magazines	2.0%	4.4%	2.0%	2.6%
High Grade	3.7%	3.8%	1.9%	1.8%
Mixed	11.2%	13.7%	15.2%	18.3%
<b>PAPER TOTALS</b>	<b>36.9%</b>	<b>41.4%</b>	<b>42.1%</b>	<b>39.6%</b>
Clear	3.4%	3.0%	2.3%	3.1%
Brown	1.2%	1.6%	0.5%	1.4%
Green	0.7%	0.5%	0.7%	0.4%
Other	N/A	0.8%	N/A	0.4%
<b>GLASS TOTALS</b>	<b>5.2%</b>	<b>5.9%</b>	<b>3.4%</b>	<b>5.3%</b>
Alum. Cans	1.1%	1.7%	0.7%	1.4%
Other Alum	0.5%	0.8%	0.3%	0.7%
Non ferrous	0.1%	0.2%	0.1%	0.1%
Food Cans	1.7%	2.7%	2.4%	4.0%
Ferrous	3.9%	0.9%	2.9%	1.1%
Oil Filters	N/A	0.0%	N/A	0.1%
<b>METAL TOTALS</b>	<b>7.1%</b>	<b>6.3%</b>	<b>6.3%</b>	<b>7.4%</b>
PET # 1	0.4%	1.5%	0.3%	2.2%
HDPE # 2	0.5%	2.0%	0.3%	2.3%
Film	N/A	3.2%	N/A	4.1%
Other Plastic	6.4%	5.8%	7.2%	5.9%
<b>PLASTIC TOTALS</b>	<b>7.2%</b>	<b>12.5%</b>	<b>7.8%</b>	<b>14.5%</b>
Food Waste	7.8%	15.2%	7.5%	16.8%
Wood Waste	N/A	1.0%		1.0%
Textiles	3.8%	3.7%	3.8%	3.7%
Diapers	2.3%	4.8%	0.7%	3.8%
Other Organics	27.0%	4.1%	24.4%	3.0%
<b>ORGANIC TOTALS</b>	<b>40.8%</b>	<b>28.8%</b>	<b>36.3%</b>	<b>28.3%</b>
Fines	2.2%	3.0%	1.7%	3.8%
Other Inorganics	0.8%	2.2%	2.5%	1.3%
<b>INORGANIC TOTALS</b>	<b>3.0%</b>	<b>5.2%</b>	<b>4.2%</b>	<b>5.1%</b>
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

TABLE 13-5

## Results by Volume

Most solid waste composition studies are recorded by weight. However, in many instances volume of the material is more significant. Some examples are calculations on landfill capacities, vehicle and storage space for recyclable materials, and compaction rates for waste haulers. This study attempted to quantify the volume of waste as well as the weight of that waste. During the sorting procedure all materials were placed in the appropriate category containers. Each identical container was three cubic feet in volume. As the container was weighed, the volume of the material within that container was estimated. Both the weight and the volume were recorded on the data sheet. The Project Manager and Sort Supervisor personally recorded and estimated the volume of all containers. This estimate is not “scientifically” accurate. However, in the process of estimating the volume of approximately 17,000 containers the waste sort personnel developed a good feel for estimating the volumes.

Table 13-6 lists the results of the Phase I waste sorts by volume and Chart 13-4 displays the same data in four pie charts. The results are somewhat expected. Paper and metal percentages are approximately the same for weight and volume. Glass, organics (especially food wastes) and inorganics were much heavier and therefore produced lower percentages of the waste stream by volume. Plastics were lighter and their volumes took up a much greater portion of the waste stream.

Table 13-7 and Chart 13-5 illustrate the relationship found between weight and volume in the Missouri waste stream. **These ratios are for uncompacted trash.** The average ratio for all materials was approximately 16 cubic yards per ton. Most conversion ratios for compacted trash is 2.5 to 4 cubic yards per ton.



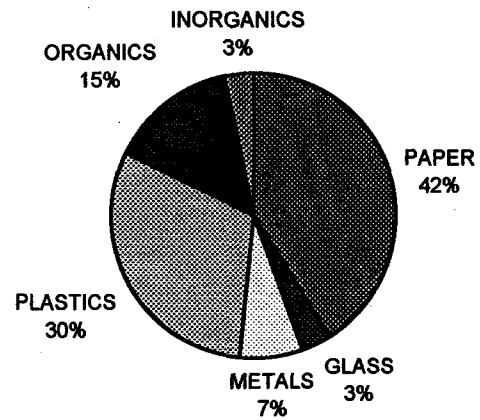
## PHASE I SUMMARY RESULTS BY VOLUME

	SORT # 1	SORT # 2	SORT #3	AVERAGE
	2/5/96-4/10/96	5/13/96-7/17/96	9/3/96-11/13/96	2/5/96-11/13/96
CATEGORY	VOL.	VOL.	VOL.	VOL.
Cardboard	12.4%	11.5%	11.5%	11.8%
Newsprint	5.7%	5.4%	5.7%	5.6%
Magazines	2.0%	1.7%	1.9%	1.9%
High Grade	2.3%	2.6%	2.9%	2.6%
Mixed	18.9%	18.6%	17.2%	18.3%
PAPER TOTALS	41.2%	39.9%	39.2%	40.2%
Clear	1.7%	1.4%	1.4%	1.5%
Brown	0.9%	0.7%	0.8%	0.8%
Green	0.3%	0.2%	0.2%	0.2%
Other	0.3%	0.3%	0.3%	0.3%
GLASS TOTALS	3.2%	2.7%	2.8%	2.9%
Alum. Cans	2.3%	2.8%	3.1%	2.7%
Other Alum	1.3%	0.9%	0.9%	1.0%
Non ferrous	0.2%	0.2%	0.2%	0.2%
Food Cans	2.9%	2.3%	2.9%	2.7%
Ferrous	0.7%	0.6%	0.7%	0.7%
Oil Filters	0.0%	0.0%	0.0%	0.0%
METAL TOTALS	7.4%	6.8%	7.8%	7.3%
PET # 1	4.4%	3.8%	3.9%	4.1%
HDPE # 2	5.2%	4.7%	5.5%	5.2%
Film	8.8%	8.3%	7.7%	8.3%
Other Plastic	11.8%	13.9%	13.7%	13.1%
PLASTIC TOTALS	30.3%	30.7%	30.9%	30.6%
Food Waste	5.4%	8.6%	8.6%	7.4%
Wood Waste	0.5%	0.5%	0.5%	0.5%
Textiles	4.0%	3.5%	3.3%	3.6%
Diapers	2.6%	2.0%	2.1%	2.3%
Other Organics	2.0%	3.0%	3.0%	2.6%
ORGANIC TOTALS	14.5%	17.5%	17.4%	16.4%
Fines	2.6%	1.7%	1.4%	1.9%
Other Inorganics	0.8%	0.7%	0.5%	0.7%
INORGANIC TOTALS	3.4%	2.4%	1.9%	2.6%
SORT TOTALS	100%	100%	100%	100%

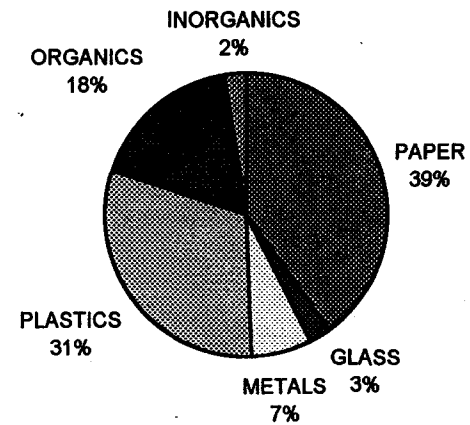
TABLE 13-6

## PHASE I SUMMARY RESULTS BY VOLUME

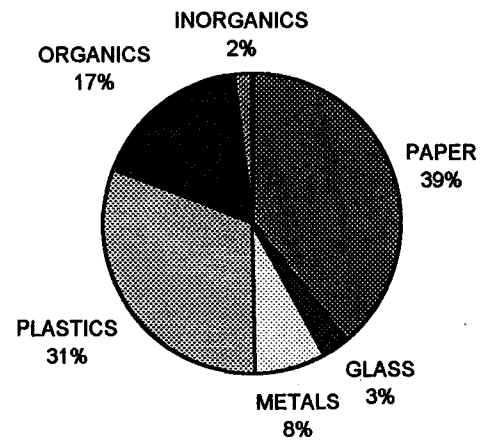
**SORT #1**



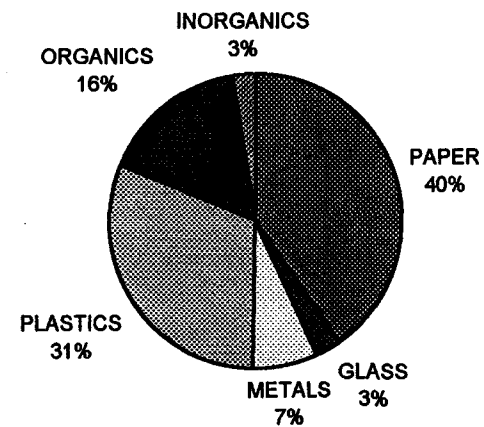
**SORT #2**



**SORT #3**



**SORT AVERAGE**





## **RELATIONSHIP BETWEEN WEIGHT AND VOLUME**

<b>CATEGORY</b>	<b>WEIGHT IN POUNDS</b>	<b>PCT. BY WEIGHT</b>	<b>VOLUME IN CU. FT.</b>	<b>PCT. BY VOLUME</b>	<b>RATIO LBS/CU.FT.</b>
<b>Cardboard</b>	4914	6.4%	1977	11.8%	2.49
<b>Newsprint</b>	6007	7.8%	935	5.6%	6.42
<b>Magazines</b>	2656	3.5%	312	1.9%	8.51
<b>High Grade</b>	2245	2.9%	432	2.6%	5.20
<b>Mixed</b>	12445	16.2%	3061	18.3%	4.07
<b>PAPER TOTALS</b>	28267	36.8%	6717	40.2%	4.21
<b>Clear</b>	2560	3.3%	257	1.5%	9.97
<b>Brown</b>	1284	1.7%	137	0.8%	9.39
<b>Green</b>	309	0.4%	37	0.2%	8.25
<b>Other</b>	501	0.7%	53	0.3%	9.38
<b>GLASS TOTALS</b>	4653	6.1%	484	2.9%	9.61
<b>Alum. Cans</b>	1185	1.5%	454	2.7%	2.61
<b>Other Alum</b>	620	0.8%	172	1.0%	3.61
<b>Non ferrous</b>	198	0.3%	31	0.2%	6.50
<b>Food Cans</b>	2376	3.1%	451	2.7%	5.27
<b>Ferrous</b>	881	1.1%	115	0.7%	7.65
<b>Oil Filters</b>	61	0.1%	5	0.03%	12.60
<b>METAL TOTALS</b>	5321	6.9%	1228	7.3%	4.33
<b>PET # 1</b>	1331	1.7%	681	4.1%	1.95
<b>HDPE # 2</b>	1619	2.1%	861	5.1%	1.88
<b>Film</b>	2696	3.5%	1393	8.3%	1.94
<b>Other Plastic</b>	5366	7.0%	2184	13.1%	2.46
<b>PLASTIC TOTALS</b>	11011	14.3%	5119	30.6%	2.15
<b>Food Waste</b>	13909	18.1%	1237	7.4%	11.25
<b>Wood Waste</b>	611	0.8%	82	0.5%	7.43
<b>Textiles</b>	3178	4.1%	601	3.6%	5.28
<b>Diapers</b>	3274	4.3%	378	2.3%	8.67
<b>Other Organics</b>	2543	3.3%	437	2.6%	5.82
<b>ORGANIC TOTALS</b>	23515	30.6%	2735	16.4%	8.60
<b>Fines</b>	2769	3.6%	324	1.9%	8.54
<b>Other Inorganics</b>	1229	1.6%	115	0.7%	10.66
<b>INORGANIC TOTALS</b>	3999	5.2%	440	2.6%	9.10
<b>SORT TOTALS</b>	76750	100%	16727	100.0%	4.59

# RELATIONSHIP BETWEEN WEIGHT AND VOLUME

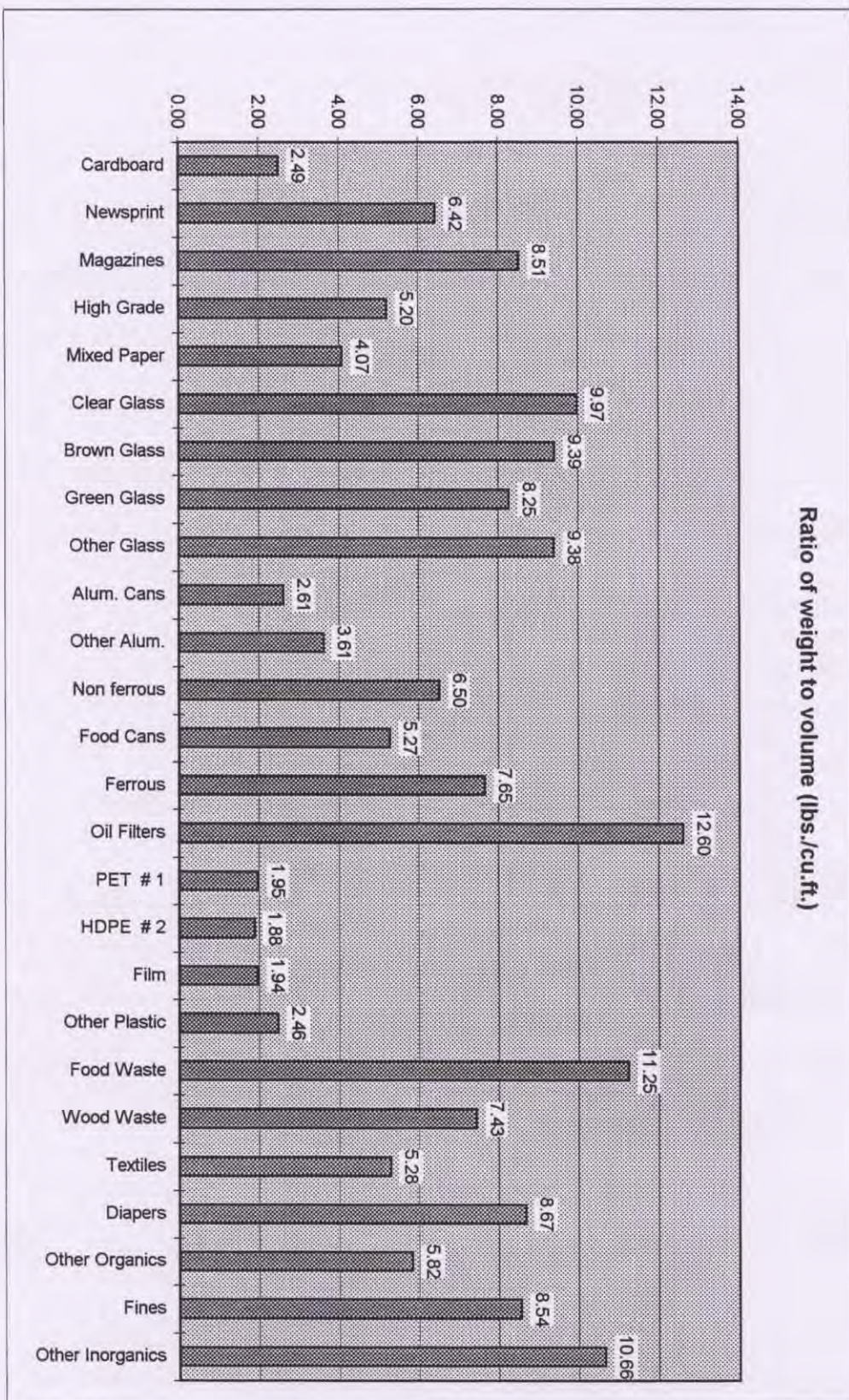


CHART 13-5



## Disposal rates of Municipal Solid Waste

As stated in Chapter 2 (methodology), this study only analyzed the municipal solid waste stream from residential and light commercial sources which was disposed in plastic bags because that is the waste stream which is normally targeted by residential and commercial waste reduction and recycling programs. Estimating the size of this waste stream is very difficult. The Missouri Department of Natural Resources (MDNR) receives data on the tonnage disposed into Missouri landfills and transfer stations, but receives no data on the composition of that tonnage. Therefore components of the total waste stream must be estimated in order to isolate the quantity of MSW.

The 1995 estimated MSW disposal and disposal rates are based on the following assumptions:

- The total adjusted disposal tonnage for Missouri is 5,701,225 (MDNR 1995 estimate, including import and export data).
- The industrial waste is still 1.6 million tons per year (EIERA estimate in 1987).
- Construction and Demolition waste is estimated at 12% or 686,210 tons (national estimates for C&D are 10-25% depending on the local growth and economic conditions).
- Sewage sludge is estimated to be 126,440 tons (MDNR 1995 estimate).
- Bulky items and durable goods such as small appliances and furniture which were not sampled are estimated to be 3.7% or 210,945 tons (*Characterization of Municipal Solid Waste in the United States: 1994 Update*).
- The current population of Missouri is 5,226,784 (Office of Administration 1995 estimate).

Based on these assumptions, the quantity of MSW disposed in Missouri landfills and transfer stations during 1995 was 3,077,630 tons (54% of the total solid waste disposed). The average MSW disposal rate was 3.22 pounds per person per day.

Most waste characterization studies attempt to estimate generation rates. Generation rates include both disposal and recovery (reuse, recycling, and composting). The disposal data is fairly reliable (providing the above assumptions are correct) and easy to calculate. However, the recovery data is very difficult to estimate with any degree of accuracy. Since recovery data is difficult to quantify, this study will only discuss disposal rates.



Table 13-8 and Chart 13-6 show the weight of each material disposed per person, per year.

This table can be used to estimate the impact of reduction and recycling programs within a community or solid waste management district. For example, a community could project the amount of material available for collection if a recycling program was implemented. The projections for each material could be calculated as follows:

- Find the weight disposed per person per year for each material considered (Table 13-8).
- Multiply by the population of the service area.
- Multiply by the estimated participation rate.

For instance, a community of 4,000 has a drop-off center for recyclables. They currently accept newspaper, glass, aluminum cans and milk jugs. Based on current operations they have a 25% participation rate by their residents. The community would like to project the impact of adding magazines to their recycling program. The calculations would be:

$$41.2 \text{ lbs per person} \times 4,000 \text{ residents} \times 25\% \text{ participation} = 41,200 \text{ lbs of magazines per year}$$

The same calculations can be used to project the amount of space needed for the addition of magazines by applying the same formula to Table 13-9.

$$4.8 \text{ cu. ft. per person} \times 4,000 \text{ residents} \times 25\% \text{ participation} = 4,800 \text{ cu. ft. per year}$$

Chart 13-7 displays a graph that shows the volume of each material disposed per person per year.

These estimates and projections are not ironclad and certainly will vary from one Missouri community to another. They are approximate figures based on the best available research and data. However they can provide some degree of assurance in planning for waste reduction and recycling.

More data is needed to quantify the different components of the total waste stream. Industrial and C&D waste streams are significant but at this point the quantity and composition are largely unknown.



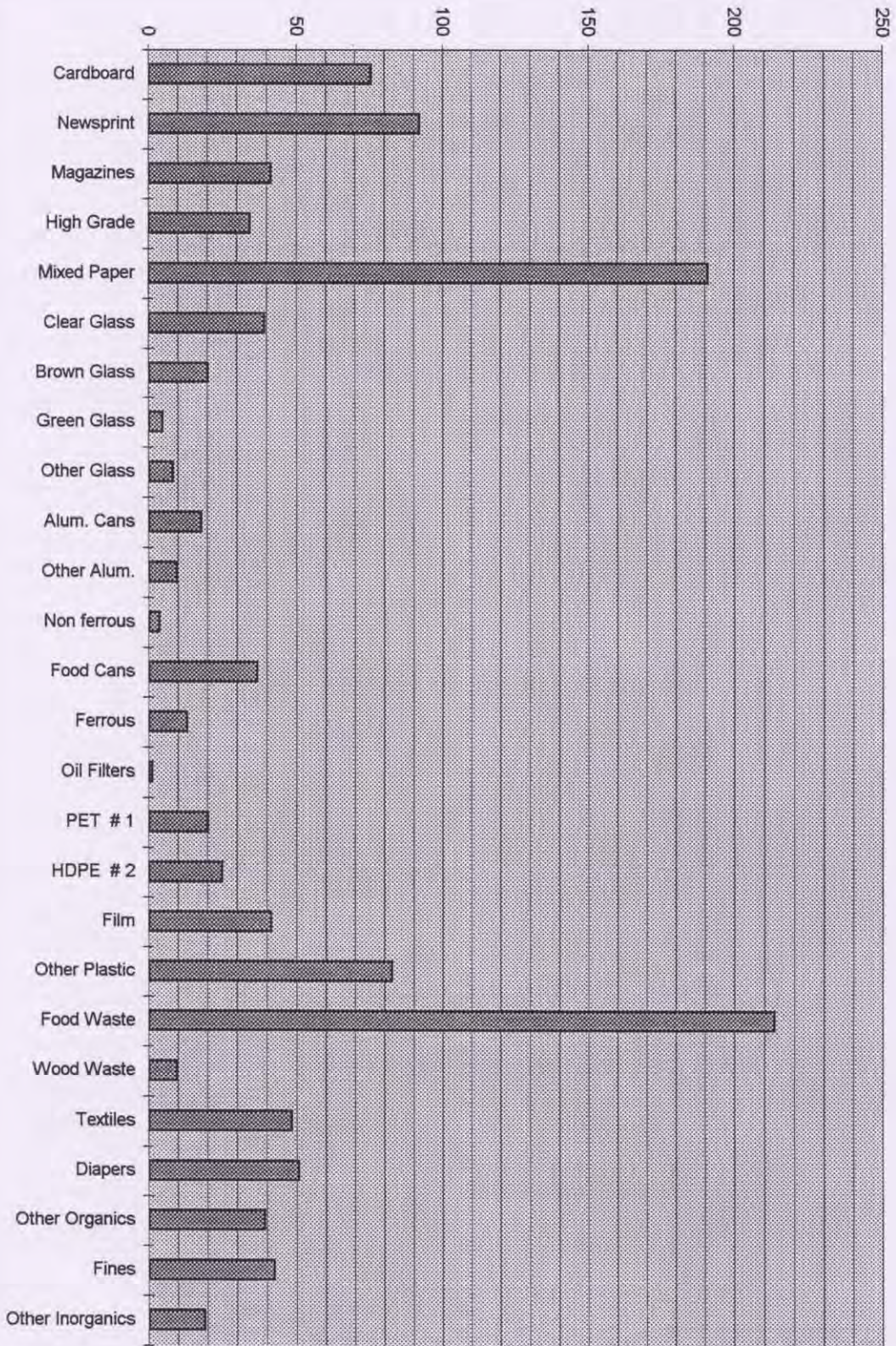
## **DISPOSAL OF MSW IN MISSOURI BY WEIGHT**

<b>CATEGORY</b>	<b>PCT. OF MO. MSW BY WT.</b>	<b>WT. DISPOSED PER PERSON PER YEAR (LBS.)</b>	<b>WT. DISPOSED IN MISSOURI PER YEAR (TONS)</b>
Cardboard	6.4%	75.4	196,968
Newsprint	7.8%	91.9	240,055
Magazines	3.5%	41.2	107,717
High Grade	2.9%	34.2	89,251
Mixed	16.2%	190.8	498,576
<b>PAPER TOTALS</b>	<b>36.8%</b>	<b>433.4</b>	<b>1,132,568</b>
Clear	3.3%	38.9	101,562
Brown	1.7%	20.0	52,320
Green	0.4%	4.7	12,311
Other	0.7%	8.2	21,543
<b>GLASS TOTALS</b>	<b>6.1%</b>	<b>71.8</b>	<b>187,735</b>
Alum. Cans	1.5%	17.7	46,164
Other Alum	0.8%	9.4	24,621
Non ferrous	0.3%	3.5	9,233
Food Cans	3.1%	36.5	95,407
Ferrous	1.1%	13.0	33,854
Oil Filters	0.1%	1.2	3,078
<b>METAL TOTALS</b>	<b>6.9%</b>	<b>81.3</b>	<b>212,356</b>
PET # 1	1.7%	20.0	52,320
HDPE # 2	2.1%	24.7	64,630
Film	3.5%	41.2	107,717
Other Plastic	7.0%	82.4	215,434
<b>PLASTIC TOTALS</b>	<b>14.3%</b>	<b>168.4</b>	<b>440,101</b>
Food Waste	18.1%	213.2	557,051
Wood Waste	0.8%	9.4	24,621
Textiles	4.1%	48.3	126,183
Diapers	4.3%	50.6	132,338
Other Organics	3.3%	38.9	101,562
<b>ORGANIC TOTALS</b>	<b>30.6%</b>	<b>360.4</b>	<b>941,755</b>
Fines	3.6%	42.4	110,795
Other Inorganics	1.6%	18.8	49,242
<b>INORGANIC TOTALS</b>	<b>5.2%</b>	<b>61.2</b>	<b>160,037</b>
<b>TOTAL</b>	<b>100.0%</b>	<b>1177.6</b>	<b>3,077,630</b>



# ESTIMATED DISPOSAL RATES OF MSW, PER PERSON, PER YEAR

Estimated disposal in pounds, per person, per year





# **DISPOSAL OF MSW IN MISSOURI BY VOLUME**

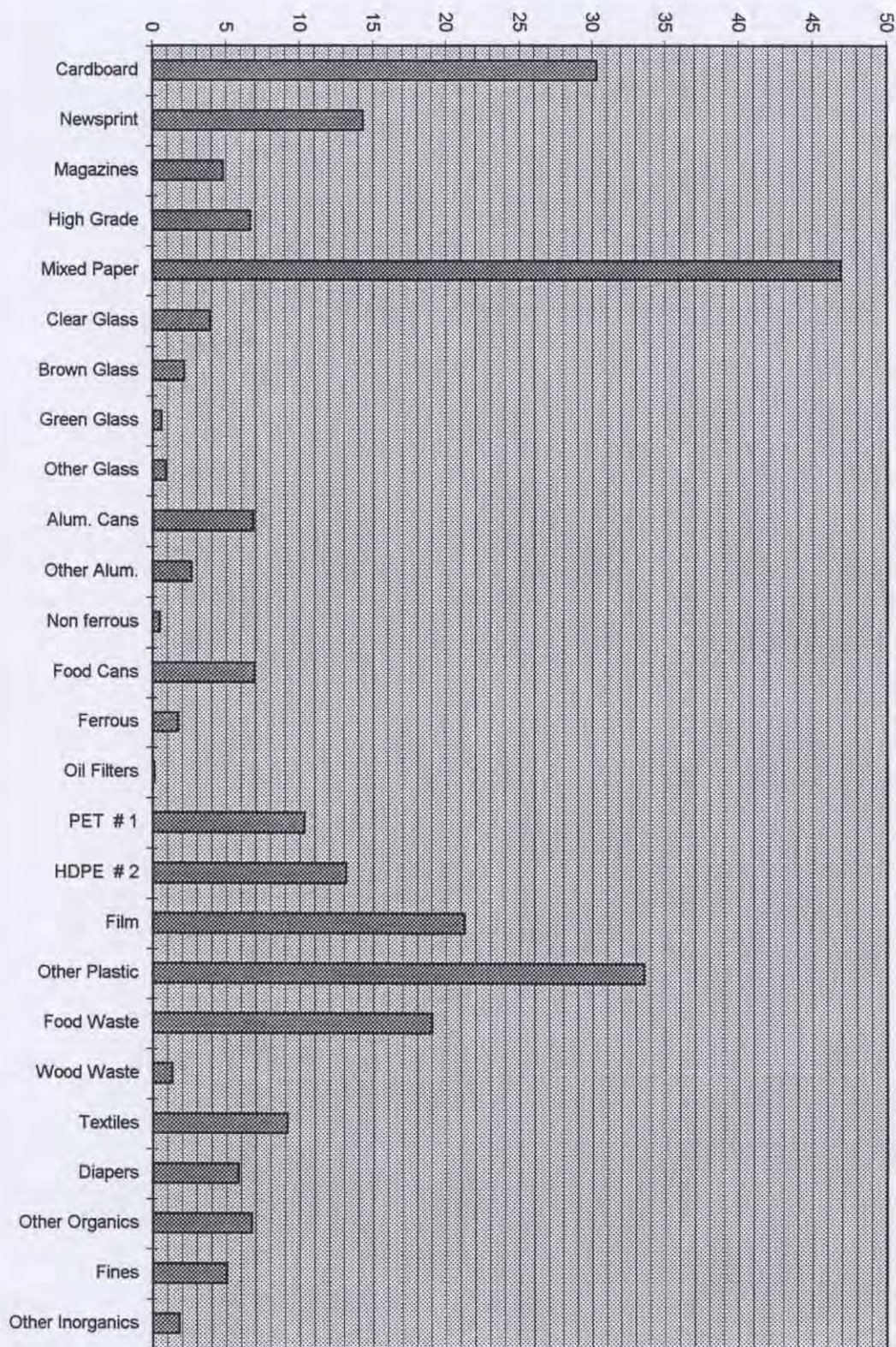
<b>CATEGORY</b>	<b>PCT. OF MO. MSW BY VOL.</b>	<b>VOL.DISPOSED PER PERSON PER YEAR (CU. FT.)</b>	<b>VOLUME DISPOSED IN MISSOURI PER YEAR (CU.YDS)</b>
<b>Cardboard</b>	11.8%	30.3	5,861,959
<b>Newsprint</b>	5.6%	14.3	2,771,094
<b>Magazines</b>	1.9%	4.8	937,213
<b>High Grade</b>	2.6%	6.6	1,273,191
<b>Mixed</b>	18.3%	46.9	9,075,170
<b>PAPER TOTALS</b>	40.2%	102.9	19,918,627
<b>Clear</b>	1.5%	3.9	755,310
<b>Brown</b>	0.8%	2.1	412,321
<b>Green</b>	0.2%	0.6	110,285
<b>Other</b>	0.3%	0.9	169,232
<b>GLASS TOTALS</b>	2.9%	7.5	1,447,147
<b>Alum. Cans</b>	2.7%	6.8	1,312,815
<b>Other Alum</b>	1.0%	2.6	504,071
<b>Non ferrous</b>	0.2%	0.5	104,238
<b>Food Cans</b>	2.7%	6.9	1,340,766
<b>Ferrous</b>	0.7%	1.7	328,967
<b>Oil Filters</b>	0.0%	0.1	18,437
<b>METAL TOTALS</b>	7.3%	18.6	3,609,294
<b>PET # 1</b>	4.1%	10.3	1,985,483
<b>HDPE # 2</b>	5.2%	13.1	2,543,372
<b>Film</b>	8.3%	21.2	4,111,178
<b>Other Plastic</b>	13.1%	33.5	6,484,297
<b>PLASTIC TOTALS</b>	30.6%	78.1	15,124,330
<b>Food Waste</b>	7.4%	19.0	3,668,643
<b>Wood Waste</b>	0.5%	1.3	244,912
<b>Textiles</b>	3.6%	9.1	1,770,859
<b>Diapers</b>	2.3%	5.8	1,129,802
<b>Other Organics</b>	2.6%	6.7	1,293,890
<b>ORGANIC TOTALS</b>	16.4%	41.9	8,108,106
<b>Fines</b>	1.9%	5.0	961,123
<b>Other Inorganics</b>	0.7%	1.8	341,406
<b>INORGANIC TOTALS</b>	2.6%	6.7	1,302,529
<b>TOTAL</b>	<b>100.0%</b>	<b>255.8</b>	<b>49,510,032</b>

TABLE 13-9



# ESTIMATED DISPOSAL OF MSW, PER PERSON, PER YEAR

Estimated disposal in cubic feet, per person, per year  
255.8 cubic feet per year total





## **Chapter 14: Phase II -Introduction**

### **What is the purpose of Phase II?**

The purpose of the Missouri Waste Composition Study is to analyze the composition of the waste stream for the state of Missouri. Waste streams vary from district to district, depending on regional factors such as the number of cities and rural areas, population, economy, tourists attraction sites, climate, employment rates, and industry. During Phase I of this study (1996), Midwest Assistance Program (MAP) conducted 29 waste sorts in ten solid waste management district throughout the state.

Phase II is a continuation of this study. The purpose of Phase II (1997) was to collect solid waste data from the remaining 9 solid waste districts for a total of 19 districts (the University of Missouri at Columbia conducted a separate waste study for the 20th waste district). Information would then be available for every solid waste district in Missouri, and analysis of the entire Missouri waste stream would include all regions of the state.

As in Phase I, three seasonal sorts were conducted in the remaining 9 solid waste districts for a total of 27 sorts. Waste sorts conducted during both Phase I and II will only examine municipal solid waste. Industrial waste, construction and demolition waste, and special waste streams are not included in this study. Comparisons of Phase I and Phase II, as well as overall comparisons with other similar studies, will be examined in Chapter 24: Phase II- Summary.

### **Methodology**

The methodology used in this study is essentially the same as in *The Missouri Waste Composition Study: Municipal Solid Waste- Phase I (1996)*. Please refer to Chapter 2: Methodology for a complete description of the methodology.

### **Selection of Sorting Sites**

The criteria for selecting waste sort locations remained the same in Phase II: 1) selecting locations that were representative of the waste within that particular district, and 2) selecting locations which could be used as a guide for cities outside the district with



similar characteristics. Maps of Missouri landfills and transfer stations are on pages 9 and 10 of Phase I. The following locations were selected for Phase II:

Butler County Landfill	City of St. Joseph Landfill
West Plains Solid Waste Transfer Station	Farmer's Landfill
Phelps County Transfer Station	Rye Creek Sanitary Landfill
Modern Sanitation Transfer Station	Central Missouri Landfill, Inc.
Waste Management of St. Louis Recycling and Transfer Facility	

Chapters 15 through 23 describe the sort locations and provide the data from those waste sorts.

### **Sort Procedure**

The sort procedure used was the same as in Phase I. However, a few revisions were made and are worth noting:

- Instead of hiring temporary sorters at each site, sorters were interviewed and hired for the duration of the study. This revision was made in order to increase sort accuracy and to decrease training time. Three sorters were hired and remained for the first and second rounds of sorts. A second group of sorters were hired to work the third round. Like before, sorters were hired as subcontractors and were responsible for travel and expenses.
- In addition to documenting the items in the "Other Waste" category (see definition on page 14), the weight and volume were also recorded. The volume was based on identical 3 cubic-foot container.

The sorting procedure used was the same as the Second and Third Round Procedure of Phase I (See page 18 for details).



## Chapter 15: Poplar Bluff (Butler County Landfill)

### COMMUNITY PROFILE

The City of Poplar Bluff is located in Butler County and is located in the southeast section of the state (close to the Bootheel region). It is the largest city in the county and is also a center for industry and retail business for the surrounding areas. Poplar Bluff is a member of the Ozark Foothills Solid Waste Management District (District Q). The Butler County Landfill is located approximately 6 miles northwest of Poplar Bluff and receives waste from Butler and the surrounding counties (St. Francois County in particular). Poplar Bluff is located along Highway 67 and is 153 miles south of St. Louis, 194 miles east of Springfield, and 360 miles southeast of Kansas City.

#### Demographics:

	Butler County	St. Francois County
Area (sq. miles)	697.46	450
Population (1990)	38,795	50,147
Density (per sq. mile)	56	112
Pop. Change since 1980	2.8%	17.7%
Number of households	15,229	17,670
Persons per household	2.49	2.59
High school graduates	31%	62.5%
Median Family Income	\$20,516	\$25,044
Percent below poverty level	25%	16.9%



### **Solid Waste Collection**

The City of Poplar Bluff relies on private haulers for city waste services. Private haulers have the option of offering curbside recycling, but are not doing so currently. There is no zoning or territories for haulers.

### **Solid Waste Disposal**

Butler County Landfill is the only landfill in within District Q. The landfill accepts waste from Butler and the surrounding counties (Wayne, Stoddard, Ripley, St. Francois, etc.). The landfill receives approximately 104,000 tons of waste per year and the current tipping fee as of November 1997 is \$32.00 per ton.

### **Waste Reduction and Recycling Programs**

There are three major waste reduction programs offered by District Q to all cities in the District. These programs include a white-goods pickup , at least one drop-off site, and curbside pickup. An Institutional Generators Program was offered in October 1997 and will target mid-sized institutions who produce moderate amounts of commercial recyclables (schools, nursing homes, etc.). There are no current education programs or household hazardous waste facilities.

### **Butler County Landfill Results**

Information about sample size and composition are listed in tables 15-1 to 15-8.

**All weights are listed in pounds and all volumes are in cubic feet.**



## **SORT #1**

### **Sort Conditions**

The first sort was conducted February 3-5, 1997. An area just above the tipping cell (on a gravel road) was the sort location. The weather was rainy and cooler, so fewer samples were collected and the weight of the samples were heavier than usual.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	1,781,380
<b>Total Sample Weight (lbs)</b>	2625
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	10

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	5	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	3	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	8	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	0	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	1	<b>Disposable Razors</b>	17
<b>Syringes</b>	10	<b>Alkaline Batteries</b>	9
<b>Hardware/Shop Products</b>	0	<b>Automobile Maintenance/Cleaning Products</b>	1
<b>Aerosol Cans</b>	4		
<b>Miscellaneous items:</b> 1 tube of contour putty, 13 bottles of gloss enamel, 1 package of bottle rockets, 1 container of propane.			
<b>Total Weight (lb): 10.5</b>			
<b>Total Volume (cubic ft.): .5</b>			



**BUTLER COUNTY LANDFILL (POPLAR BLUFF)**  
**SORT #1**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	249.1	50.9	5%	95%	Drop-off/curbside	Poplar Bluff (city)
2	158.6	45.4	95%	5%	Drop-off	Butler Co. (rural locations)
3	258.1	52.5	95%	5%	Drop-off	Butler Co. (rural locations)
4	241.6	43.7	80%	20%	Curbside	Piedmont and surrounding areas
5	281.1	60.3	90%	10%	Drop-off/curbside	Poplar Bluff (rural)
6	277.6	46.4	100%	0%	Curbside	Ellsinore (in town)
7	275.6	42.3	90%	10%	Drop-off/curbside	Greenville (rural)
8	300.1	60.3	100%	0%	Drop-off/curbside	Poplar Bluff (in town)
9	328.6	55.3	20%	80%	Drop-off/curbside	Neelyville (rural)
10	255.1	44	50%	50%	None	Puxico and surrounding areas (mix)
<b>TOTALS</b>	<b>2625.5</b>	<b>500.9</b>				
<b>AVERAGE</b>	<b>262.55</b>	<b>50.09</b>	<b>72%</b>	<b>28%</b>		

TABLE 15-1



**BUTLER COUNTY LANDFILL (POPLAR BLUFF)**

**SORT # 1**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	154.0	49.5	15.4	5.0	5.87%	9.88%
Newsprint	179.5	23.4	18.0	2.3	6.84%	4.67%
Magazines	97.0	8.2	9.7	0.8	3.70%	1.64%
High Grade	109.0	21.6	10.9	2.2	4.15%	4.31%
Mixed	444.5	94.3	44.5	9.4	16.93%	18.82%
<b>PAPER TOTALS</b>	<b>984.0</b>	<b>197.0</b>	<b>98.4</b>	<b>19.7</b>	<b>37.49%</b>	<b>39.32%</b>
Clear	60.0	5.1	6.0	0.5	2.29%	1.02%
Brown	26.5	3.3	2.7	0.3	1.01%	0.66%
Green	14.5	1.0	1.5	0.1	0.55%	0.20%
Other	32.0	2.8	3.2	0.3	1.22%	0.56%
<b>GLASS TOTALS</b>	<b>133.0</b>	<b>12.2</b>	<b>13.3</b>	<b>1.2</b>	<b>5.07%</b>	<b>2.44%</b>
Alum. Cans	36.0	11.3	3.6	1.1	1.37%	2.26%
Other Alum	31.0	11.8	3.1	1.2	1.18%	2.36%
Non ferrous	9.5	0.6	1.0	0.1	0.36%	0.12%
Food Cans	108.0	25.9	10.8	2.6	4.11%	5.17%
Ferrous	30.0	4.3	3.0	0.4	1.14%	0.85%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>214.5</b>	<b>53.9</b>	<b>21.5</b>	<b>5.4</b>	<b>8.17%</b>	<b>10.76%</b>
PET # 1	43.5	16.0	4.4	1.6	1.66%	3.19%
HDPE # 2	48.0	22.5	4.8	2.2	1.83%	4.48%
Film	104.5	41.7	10.5	4.2	3.98%	8.33%
Other Plastic	161.0	61.6	16.1	6.2	6.13%	12.30%
<b>PLASTIC TOTALS</b>	<b>357.0</b>	<b>141.8</b>	<b>35.7</b>	<b>14.2</b>	<b>13.60%</b>	<b>28.30%</b>
Food Waste	548.5	50.0	54.9	5.0	20.90%	9.98%
Wood Waste	9.0	1.3	0.9	0.1	0.34%	0.26%
Textiles	90.0	11.0	9.0	1.1	3.43%	2.20%
Diapers	124.5	12.6	12.5	1.3	4.74%	2.52%
Other Organics	72.5	12.9	7.3	1.3	2.76%	2.58%
<b>ORGANIC TOTALS</b>	<b>844.5</b>	<b>87.8</b>	<b>84.5</b>	<b>8.8</b>	<b>32.17%</b>	<b>17.53%</b>
Fines	50.0	5.6	5.0	0.6	1.90%	1.12%
Other Inorganics	31.5	2.2	3.2	0.2	1.20%	0.44%
<b>INORGANIC TOTALS</b>	<b>81.5</b>	<b>7.8</b>	<b>8.2</b>	<b>0.8</b>	<b>3.10%</b>	<b>1.56%</b>
<b>OTHER WASTE</b>	<b>10.5</b>	<b>0.5</b>	<b>1.1</b>	<b>0.1</b>	<b>0.40%</b>	<b>0.10%</b>
<b>GRAND TOTAL</b>	<b>2625.0</b>	<b>500.9</b>	<b>262.5</b>	<b>50.1</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 15-2



## **SORT #2**

### **Sort Conditions**

The second sort was conducted April 28-29, 1997. The sort location was the same as in Sort #1. The weather was sunny, mild and windy.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	1,781,380
Total Sample Weight (lbs)	2374.6
Significance Test Results	.000
Number of Samples Collected	10

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	7	Beauty/Hygiene Aerosol Products	1
Prescription Medication (Rx)	13	Household Cleaning Aerosol Products	2
Beauty/Hygiene Products	12	Gardening/Yard Care Products	0
Household Cleaning Products	1	Pet Groom Products	0
Sharps/Blades	0	Disposable Razors	18
Syringes	11	Alkaline Batteries	9
Hardware/Shop Products	1	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	0		
Miscellaneous items: 1 polar pack (ice pack), 1 thermometer.			
Total Weight (lb): 13.0			
Total Volume (cubic ft.): .5			



**BUTLER COUNTY LANDFILL (POPLAR BLUFF)****SORT # 2**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	157.1	54.2	15.7	5.4	6.62%	10.51%
Newsprint	169.5	25.0	17.0	2.5	7.14%	4.85%
Magazines	82.6	10.4	8.3	1.0	3.48%	2.02%
High Grade	71.8	18.0	7.2	1.8	3.02%	3.49%
Mixed	322.6	82.4	32.3	8.2	13.59%	15.97%
<b>PAPER TOTALS</b>	<b>803.6</b>	<b>190.0</b>	<b>80.4</b>	<b>19.0</b>	<b>33.84%</b>	<b>36.83%</b>
Clear	69.3	6.0	6.9	0.6	2.92%	1.16%
Brown	29.6	3.0	3.0	0.3	1.25%	0.58%
Green	13.6	0.6	1.4	0.1	0.57%	0.12%
Other	19.1	1.7	1.9	0.2	0.80%	0.33%
<b>GLASS TOTALS</b>	<b>131.6</b>	<b>11.3</b>	<b>13.2</b>	<b>1.1</b>	<b>5.54%</b>	<b>2.19%</b>
Alum. Cans	31.2	10.8	3.1	1.1	1.31%	2.09%
Other Alum	20.7	6.2	2.1	0.6	0.87%	1.20%
Non ferrous	8.5	0.9	0.9	0.1	0.36%	0.17%
Food Cans	102.4	20.4	10.2	2.0	4.31%	3.95%
Ferrous	28.1	3.9	2.8	0.4	1.18%	0.76%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>190.9</b>	<b>42.2</b>	<b>19.1</b>	<b>4.2</b>	<b>8.04%</b>	<b>8.18%</b>
PET # 1	44.4	20.8	4.4	2.1	1.87%	4.03%
HDPE # 2	62.5	29.0	6.3	2.9	2.63%	5.62%
Film	80.7	48.0	8.1	4.8	3.40%	9.30%
Other Plastic	174.5	67.5	17.5	6.8	7.35%	13.08%
<b>PLASTIC TOTALS</b>	<b>362.1</b>	<b>165.3</b>	<b>36.2</b>	<b>16.5</b>	<b>15.25%</b>	<b>32.04%</b>
Food Waste	509.8	49.0	51.0	4.9	21.47%	9.50%
Wood Waste	13.1	2.6	1.3	0.3	0.55%	0.50%
Textiles	73.0	16.0	7.3	1.6	3.07%	3.10%
Diapers	93.2	10.3	9.3	1.0	3.92%	2.00%
Other Organics	77.8	15.2	7.8	1.5	3.28%	2.95%
<b>ORGANIC TOTALS</b>	<b>766.9</b>	<b>93.1</b>	<b>76.7</b>	<b>9.3</b>	<b>32.30%</b>	<b>18.05%</b>
Fines	54.6	8.6	5.5	0.9	2.30%	1.67%
Other Inorganics	51.9	4.4	5.2	0.4	2.19%	0.85%
<b>INORGANIC TOTALS</b>	<b>106.5</b>	<b>13.0</b>	<b>10.7</b>	<b>1.3</b>	<b>4.48%</b>	<b>2.52%</b>
<b>OTHER WASTE</b>	<b>13.0</b>	<b>0.5</b>	<b>1.3</b>	<b>0.1</b>	<b>0.55%</b>	<b>0.10%</b>
<b>GRAND TOTAL</b>	<b>2374.6</b>	<b>515.9</b>	<b>237.5</b>	<b>51.6</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 15-4



# **BUTLER COUNTY LANDFILL (POPLAR BLUFF)**

## **SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	229.7	50.6	100%	0%	Drop-off	Poplar Bluff
2	244.6	58	100%	0%	Drop-off	Poplar Bluff
3	269.8	56.2	70%	30%	Drop-off	Poplar Bluff (general area)
4	250.3	57	70%	30%	Drop-off	Poplar Bluff (general area)
5	241.6	46.4	100%	0%	Drop-off	Poplar Bluff and county area)
6	166.8	46.3	100%	0%	Drop-off	Poplar Bluff and county area)
7	259	55.6	100%	0%	Both	Mountain View
8	213.3	48.4	100%	0%	Both	Mountain View
9	266.7	52.6	100%	0%	Drop-off	Poplar Bluff
10	232.8	44.8	100%	0%	Drop-off	Poplar Bluff
<b>TOTALS</b>	<b>2374.6</b>	<b>515.9</b>				
<b>AVERAGE</b>	<b>237.46</b>	<b>51.6</b>	<b>94%</b>	<b>6%</b>		

TABLE 15-3



### Sort #3

The third sort was conducted October 13-16, 1997. An area next to the tipping cell was selected as the sort location. The weather was rainy and cool.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	1,781,380
Total Sample Weight (lbs)	3145.5
Significance Test Results	.000
Number of Samples Collected	12

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	3	Beauty/Hygiene Aerosol Products	1
Prescription Medication (Rx)	2	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	1	Gardening/Yard Care Products	0
Household Cleaning Products	2	Pet Groom Products	0
Sharps/Blades	3	Disposable Razors	24
Syringes	19	Alkaline Batteries	50
Hardware/Shop Products	0	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	2		
Miscellaneous items: 1 book of matches.			
Total Weight (lb): 9.2			
Total Volume (cubic ft.): 0.3			



**BUTLER COUNTY LANDFILL (POPLAR BLUFF)**  
**SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	301.9	57.5	50%	50%	None	Puxico
2	288.3	58.3	90%	10%	None	Fisk
3	304.8	58.2	95%	5%	Drop-off	Poplar Bluff
4	339.7	58.8	95%	5%	Drop-off	Poplar Bluff
5	290.8	52	90%	10%	Drop-off	Poplar Bluff
6	220.1	48.8	90%	10%	Drop-off	Poplar Bluff
7	237	48.9	90%	10%	Drop-off	Poplar Bluff
8	234.2	62.4	90%	10%	Drop-off	Poplar Bluff
9	247.9	54	100%	0%	Curbside/Drop-off	Piedmont
10	215.2	54.75	100%	0%	Drop-off	Poplar Bluff
11	237.8	66.25	95%	5%	Drop-off	Broseley (rural), Poplar Bluff
12	219.1	48.1	50%	50%	Curbside/Drop-off	Mountain View
<b>TOTALS</b>	<b>3145.5</b>	<b>668</b>				
<b>AVERAGE</b>	<b>262.125</b>	<b>55.7</b>	<b>86%</b>	<b>14%</b>		

TABLE 15-5



**BUTLER COUNTY LANDFILL (POPLAR BLUFF)****SORT # 3**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	210.0	70.3	17.5	5.9	6.68%	10.51%
Newsprint	220.0	35.9	18.3	3.0	6.99%	5.36%
Magazines	173.0	17.0	14.4	1.4	5.50%	2.54%
High Grade	82.1	19.5	6.8	1.6	2.61%	2.91%
Mixed	467.5	114.0	39.0	9.5	14.86%	17.06%
<b>PAPER TOTALS</b>	<b>1152.6</b>	<b>256.5</b>	<b>96.0</b>	<b>21.4</b>	<b>36.64%</b>	<b>38.38%</b>
Clear	108.8	5.5	9.1	0.5	3.46%	0.82%
Brown	42.7	3.1	3.6	0.3	1.36%	0.46%
Green	9.1	1.1	0.8	0.1	0.29%	0.16%
Other	22.5	1.6	1.9	0.1	0.72%	0.24%
<b>GLASS TOTALS</b>	<b>183.1</b>	<b>11.2</b>	<b>15.3</b>	<b>0.9</b>	<b>5.82%</b>	<b>1.68%</b>
Alum. Cans	53.4	21.6	4.5	1.8	1.70%	3.23%
Other Alum	24.2	6.9	2.0	0.6	0.77%	1.03%
Non ferrous	5.2	0.7	0.4	0.1	0.16%	0.10%
Food Cans	132.1	25.1	11.0	2.1	4.20%	3.76%
Ferrous	41.9	6.0	3.5	0.5	1.33%	0.90%
Oil Filters	2.0	0.1	0.2	0.0	0.06%	0.01%
<b>METAL TOTALS</b>	<b>258.8</b>	<b>60.4</b>	<b>21.6</b>	<b>5.0</b>	<b>8.23%</b>	<b>9.04%</b>
PET # 1	60.2	34.5	5.0	2.9	1.91%	5.16%
HDPE # 2	71.6	45.7	6.0	3.8	2.28%	6.84%
Film	129.4	64.3	10.8	5.4	4.11%	9.61%
Other Plastic	183.2	85.5	15.3	7.1	5.82%	12.79%
<b>PLASTIC TOTALS</b>	<b>444.4</b>	<b>229.9</b>	<b>37.0</b>	<b>19.2</b>	<b>14.13%</b>	<b>34.40%</b>
Food Waste	591.9	54.5	49.3	4.5	18.82%	8.15%
Wood Waste	19.5	3.9	1.6	0.3	0.62%	0.58%
Textiles	99.4	17.5	8.3	1.5	3.16%	2.62%
Diapers	150.5	9.6	12.5	0.8	4.78%	1.43%
Other Organics	60.5	10.4	5.0	0.9	1.92%	1.56%
<b>ORGANIC TOTALS</b>	<b>921.8</b>	<b>95.8</b>	<b>76.8</b>	<b>8.0</b>	<b>29.30%</b>	<b>14.34%</b>
Fines	119.1	10.6	9.9	0.9	3.79%	1.58%
Other Inorganics	56.6	3.6	4.7	0.3	1.80%	0.54%
<b>INORGANIC TOTALS</b>	<b>175.7</b>	<b>14.2</b>	<b>14.6</b>	<b>1.2</b>	<b>5.59%</b>	<b>2.12%</b>
<b>OTHER WASTE</b>	<b>9.2</b>	<b>0.3</b>	<b>0.8</b>	<b>0.03</b>	<b>0.29%</b>	<b>0.04%</b>
<b>GRAND TOTAL</b>	<b>3145.5</b>	<b>668.3</b>	<b>262.1</b>	<b>55.7</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 15-6



## **SORT SUMMARY**

### **Seasonal variations**

- The food waste and fines categories were higher in the third round of sorts than round one or two. This was due to the large number of fast food routes collected in this sampling period.
- Food waste and diapers were slightly higher. This seems to be the tendency in areas that are predominately rural.
- The paper totals were larger in the third round due to heavy rains (the water makes the paper heavier).

### **Sort results**

- Chart 15-1 graphically compares the three seasonal sort results and shows the average waste composition, by major category, for Poplar Bluff.
- The sample data for all Poplar Bluff waste sorts are listed on Table 15-7.
- The sort results for Poplar Bluff are listed on Table 15-8.
- The summary of statistical relevance for the Poplar Bluff sorts is located on page 244.
- The total for all “other wastes” found during the Poplar Bluff sorts is on page 244.

**All weights are in pounds and volumes are listed in cubic feet.**

Comparisons of the Poplar Bluff's waste stream to previous studies and other communities can be found in Chapter 24.



## POPLAR BLUFF RESULTS BY WEIGHT

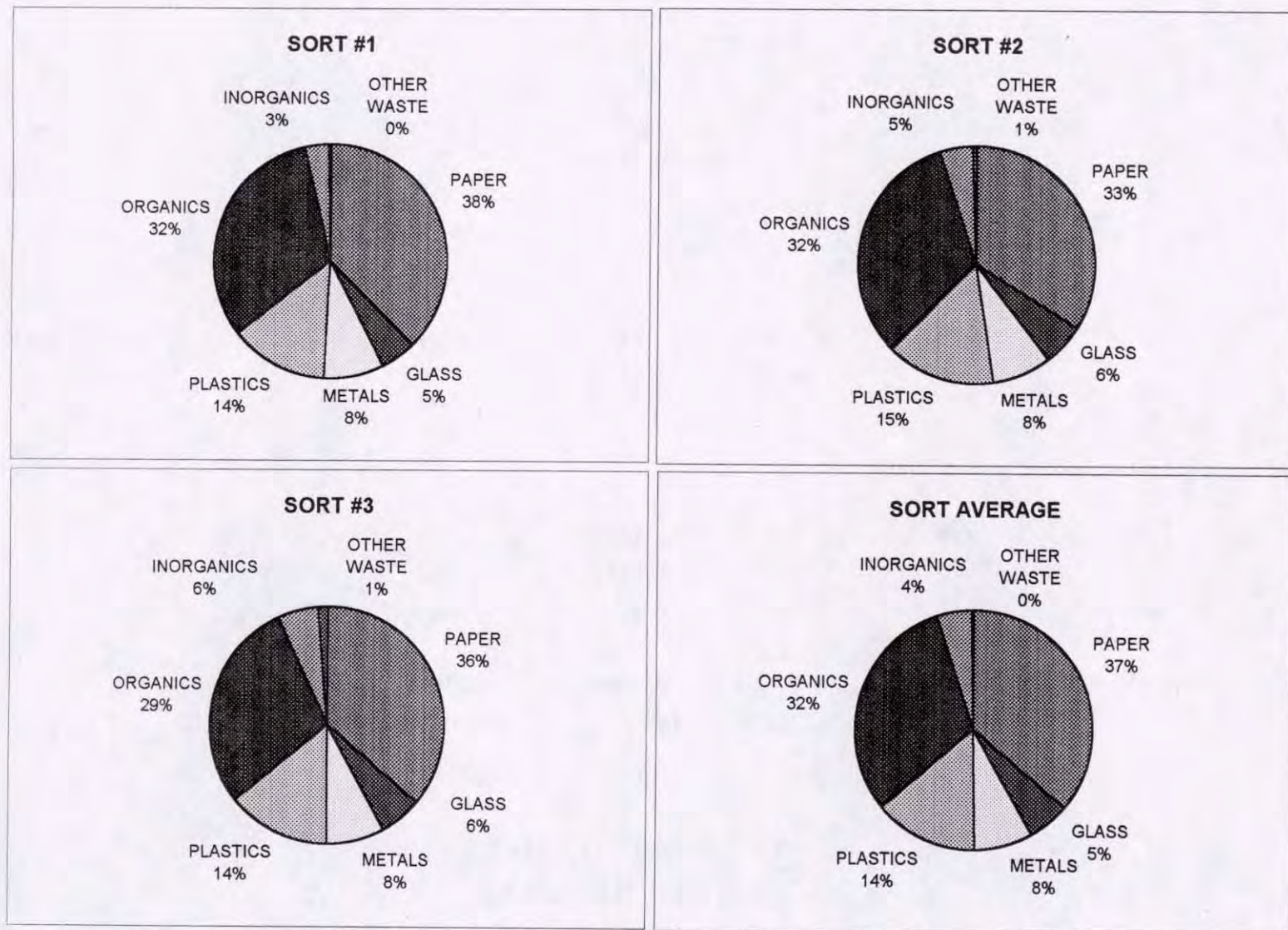


CHART 15-1



CATEGORY	POPLAR BLUFF						SUMMARY	
	SORT # 1		SORT # 2		SORT #3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	5.9%	9.9%	6.6%	10.5%	6.7%	10.5%	6.4%	10.3%
Newsprint	6.8%	4.7%	7.1%	4.9%	7.0%	5.4%	7.0%	5.0%
Magazines	3.7%	1.6%	3.5%	2.0%	5.5%	2.5%	4.3%	2.1%
High Grade	4.2%	4.3%	3.0%	3.5%	2.6%	2.9%	3.2%	3.5%
Mixed	16.9%	18.8%	13.6%	16.0%	14.9%	17.1%	15.2%	17.3%
<b>PAPER TOTALS</b>	<b>37.5%</b>	<b>39.3%</b>	<b>33.8%</b>	<b>36.9%</b>	<b>36.6%</b>	<b>38.4%</b>	<b>36.2%</b>	<b>38.2%</b>
Clear	2.3%	1.0%	2.9%	1.2%	3.5%	0.8%	2.9%	1.0%
Brown	1.0%	0.7%	1.2%	0.6%	1.4%	0.5%	1.2%	0.6%
Green	0.6%	0.2%	0.6%	0.1%	0.3%	0.2%	0.5%	0.2%
Other	1.2%	0.6%	0.8%	0.3%	0.7%	0.2%	0.9%	0.4%
<b>GLASS TOTALS</b>	<b>5.1%</b>	<b>2.4%</b>	<b>5.5%</b>	<b>2.2%</b>	<b>5.8%</b>	<b>1.7%</b>	<b>5.5%</b>	<b>2.1%</b>
Alum. Cans	1.4%	2.3%	1.3%	2.1%	1.7%	3.2%	1.5%	2.6%
Other Alum	1.2%	2.4%	0.9%	1.2%	0.8%	1.0%	0.9%	1.5%
Non ferrous	0.4%	0.1%	0.4%	0.2%	0.2%	0.1%	0.3%	0.1%
Food Cans	4.1%	5.2%	4.3%	4.0%	4.2%	3.8%	4.2%	4.2%
Ferrous	1.1%	0.9%	1.2%	0.8%	1.3%	0.9%	1.2%	0.8%
Oil Filters	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
<b>METAL TOTALS</b>	<b>8.2%</b>	<b>10.8%</b>	<b>8.0%</b>	<b>8.2%</b>	<b>8.2%</b>	<b>9.0%</b>	<b>8.2%</b>	<b>9.3%</b>
PET # 1	1.7%	3.2%	1.9%	4.0%	1.9%	5.2%	1.8%	4.2%
HDPE # 2	1.8%	4.5%	2.6%	5.6%	2.3%	6.8%	2.2%	5.8%
Film	4.0%	8.3%	3.4%	9.3%	4.1%	9.6%	3.9%	9.1%
Other Plastic	6.1%	12.3%	7.3%	13.1%	5.8%	12.8%	6.4%	12.7%
<b>PLASTIC TOTALS</b>	<b>13.6%</b>	<b>28.3%</b>	<b>15.2%</b>	<b>32.1%</b>	<b>14.1%</b>	<b>34.4%</b>	<b>14.3%</b>	<b>31.9%</b>
Food Waste	20.9%	10.0%	21.5%	9.5%	18.8%	8.2%	20.3%	9.1%
Wood Waste	0.3%	0.3%	0.6%	0.5%	0.6%	0.6%	0.5%	0.5%
Textiles	3.4%	2.2%	3.1%	3.1%	3.2%	2.6%	3.2%	2.6%
Diapers	4.7%	2.5%	3.9%	2.0%	4.8%	1.4%	4.5%	1.9%
Other Organics	2.8%	2.6%	3.3%	2.9%	1.9%	1.6%	2.6%	2.3%
<b>ORGANIC TOTALS</b>	<b>32.2%</b>	<b>17.5%</b>	<b>32.3%</b>	<b>18.1%</b>	<b>29.3%</b>	<b>14.3%</b>	<b>31.2%</b>	<b>16.4%</b>
Fines	1.9%	1.1%	2.3%	1.7%	3.8%	1.6%	2.8%	1.5%
Other Inorganics	1.2%	0.4%	2.2%	0.9%	1.8%	0.5%	1.7%	0.6%
<b>INORGANIC TOTALS</b>	<b>3.1%</b>	<b>1.6%</b>	<b>4.5%</b>	<b>2.5%</b>	<b>5.6%</b>	<b>2.1%</b>	<b>4.5%</b>	<b>2.1%</b>
<b>OTHER WASTE</b>	<b>0.4%</b>	<b>0.1%</b>	<b>0.5%</b>	<b>0.1%</b>	<b>1.4%</b>	<b>0.3%</b>	<b>0.4%</b>	<b>0.1%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 15-8



Poplar Bluff Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	5,344,140
Total Sample Weight (lbs)	8145.6
Significance Test Results	.000
Number of Samples Collected	32
Mean Sample (lbs) and Confidence Interval (95%)	253.52 (+/-) 14.37

Poplar Bluff "Other Waste" Summary			
Over-the-counter Medication (OTC)	15	Beauty/Hygiene Aerosol Products	2
Prescription Medication (Rx)	18	Household Cleaning Aerosol Products	2
Beauty/Hygiene Products	21	Gardening/Yard Care Products	0
Household Cleaning Products	3	Pet Groom Products	0
Sharps/Blades	4	Disposable Razors	59
Syringes	40	Alkaline Batteries	68
Hardware/Shop Products	1	Automobile Maintenance/Cleaning Products	1
Aerosol Cans	6		
Miscellaneous items: 1 tube of contour putty, 13 bottles of gloss enamel, 1 package of bottle rockets, 1 container of propane., 1 polar pack (ice pack), 1 thermometer, 1 book of matches..			
Total Weight (lb): 32.7 Total Volume (cubic ft.): 1.3			



## Chapter 16: West Plains

### COMMUNITY PROFILE

The City of West Plains is located in South Central Missouri ( in Howell County) and is a member of the South Central Solid Waste Management District (District P). West Plains is the largest city in District P and has the major manufacturing and economic base in the area. It is also one of the fastest growing cities in the southern part of Missouri (second to Springfield) and in recent years has doubled in size. The West Plains Transfer Station is owned and operated by the City of West Plains. The facility collects solid waste from West Plains and the surrounding communities. West Plains is located on Highway 63 and is 203 miles southwest of St. Louis, 108 miles east of Springfield, and 276 miles southeast of Kansas City.

#### Demographics:

	West Plains	Howell County
Area (sq. miles)	8.46	927.67
Population (1990)	8913	31,447
Density (per sq. mile)	1054	34
Pop. Change since 1980	15.1%	9.2%
Number of households	3,814	12,436
Persons per household	2.20	2.48
High school graduates	29.3%	34.9%
Median Family Income	\$21,250	\$20,154
Percent below poverty level	28.8%	25.4%



### **Solid Waste Collection**

Most solid waste collection services are municipally owned and operated. Curbside recycling is mandatory for the City of West Plains.

### **Solid Waste Disposal**

Since there is no landfill in District P, the waste collected at this transfer station is transferred to the Hartsville Landfill in Wright County (75 miles away). The West Plains Transfer Station receives approximately 11,704 tons of waste per year from West Plains and the surrounding areas in Howell County. The tipping fee is \$40.00 per ton with a \$10.00 minimum.

### **Waste Disposal and Reduction Programs**

The City of West Plains Recycling Center (city owned and operated) has been open for 7 years and collects cardboard; mixed paper; newsprint; magazines; plastics #1, #2, #3, #4, and #5; aluminum can, tin cans, and glass. The City collects approximately 931.5 tons of recyclables per year. West Plains Recycling (private) collects the same materials as the City plus white goods. The City does pick up white goods, but delivers them to West Plains Recycling for disposal. The Solid Waste Management District collects household hazardous waste in the area on a monthly basis.

### **City of West Plains Transfer Station Results**

Information about sample size and composition are listed in tables 16-1 to 16-8.

**All weights are listed in pounds and all volumes are in cubic feet**

**SORT #1**

### Sort Conditions

The first sort was conducted February 10-11, 1997. A grassy section beside the transfer station was used for the sort. The weather was cold and overcast.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	30,769
Total Sample Weight (lbs)	2994.1
Significance Test Results	.000
Number of Samples Collected	12

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	0	Beauty/Hygiene Aerosol Products	0
Prescription Medication (Rx)	6	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	3	Gardening/Yard Care Products	0
Household Cleaning Products	0	Pet Groom Products	0
Sharps/Blades	2	Disposable Razors	9
Syringes	12	Alkaline Batteries	7
Hardware/Shop Products	2	Automobile Maintenance/Cleaning Products	1
Aerosol Cans	1		
Miscellaneous items: IV bags with saline solution, 4 bags of ice gel.			
Total Weight (1b): 11.0			
Total Volume (cubic ft.): .5			



# CITY OF WEST PLAINS TRANSFER STATION

## SORT #1

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	234.9	57.6	10%	90%	Curbside/drop-off	West Plains (residential-city)
2	303.4	51.7	10%	90%	Curbside/drop-off	West Plains (residential-city)
3	237.4	56	90%	10%	Curbside/drop-off	West Plains (residential-city)
4	226.9	44.3	50%	50%	Curbside/drop-off	Willow Springs (residential and rural)
5	243.9	47.4	50%	50%	Curbside/drop-off	Willow Springs (residential and rural)
6	308	78.1	50%	50%	Curbside/drop-off	West Plains (residential-city)
7	242.5	54.8	50%	50%	Curbside/drop-off	West Plains (residential-city)
8	280.5	53.8	50%	50%	Curbside/drop-off	West Plains (residential-city)
9	268.9	50.9	50%	50%	Curbside/drop-off	West Plains (residential-city)
10	208.4	42.4	50%	50%	Curbside/drop-off	West Plains (residential-city)
11	197.9	49.1	90%	10%	Curbside/drop-off	West Plains (residential-city)
12	241.1	47.9	90%	10%	Curbside/drop-off	Willow Springs (residential)
<b>TOTALS</b>	<b>2994.1</b>	<b>634.5</b>				
<b>AVERAGE</b>	<b>249.508</b>	<b>52.875</b>	<b>53%</b>	<b>47%</b>		



**CITY OF WEST PLAINS TRANSFER STATION**

**SORT # 1**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	170.0	60.8	14.2	5.1	5.68%	9.58%
Newsprint	119.5	20.0	10.0	1.7	3.99%	3.15%
Magazines	92.0	9.6	7.7	0.8	3.07%	1.51%
High Grade	280.5	56.0	23.4	4.7	9.37%	8.83%
Mixed	528.0	128.0	44.0	10.7	17.63%	20.17%
<b>PAPER TOTALS</b>	<b>1190.0</b>	<b>274.4</b>	<b>99.2</b>	<b>22.9</b>	<b>39.75%</b>	<b>43.25%</b>
Clear	63.0	4.2	5.3	0.4	2.10%	0.66%
Brown	18.1	1.3	1.5	0.1	0.60%	0.20%
Green	18.0	1.2	1.5	0.1	0.60%	0.19%
Other	18.1	1.6	1.5	0.1	0.60%	0.25%
<b>GLASS TOTALS</b>	<b>117.2</b>	<b>8.3</b>	<b>9.8</b>	<b>0.7</b>	<b>3.92%</b>	<b>1.31%</b>
Alum. Cans	52.5	18.8	4.4	1.6	1.75%	2.96%
Other Alum	29.0	6.8	2.4	0.6	0.97%	1.07%
Non ferrous	10.5	2.2	0.9	0.2	0.35%	0.35%
Food Cans	91.5	12.3	7.6	1.0	3.06%	1.93%
Ferrous	30.0	4.2	2.5	0.4	1.00%	0.66%
Oil Filters	24.5	1.1	2.0	0.1	0.82%	0.17%
<b>METAL TOTALS</b>	<b>238.0</b>	<b>45.4</b>	<b>19.8</b>	<b>3.8</b>	<b>7.95%</b>	<b>7.15%</b>
PET # 1	50.5	21.3	4.2	1.8	1.69%	3.36%
HDPE # 2	53.0	18.9	4.4	1.6	1.77%	2.98%
Film	153.5	66.5	12.8	5.5	5.13%	10.48%
Other Plastic	251.5	97.2	21.0	8.1	8.40%	15.32%
<b>PLASTIC TOTALS</b>	<b>508.5</b>	<b>203.9</b>	<b>42.4</b>	<b>17.0</b>	<b>16.98%</b>	<b>32.14%</b>
Food Waste	548.0	54.2	45.7	4.5	18.30%	8.54%
Wood Waste	34.5	3.8	2.9	0.3	1.15%	0.60%
Textiles	80.3	13.6	6.7	1.1	2.68%	2.14%
Diapers	103.0	10.2	8.6	0.9	3.44%	1.61%
Other Organics	37.5	5.0	3.1	0.4	1.25%	0.79%
<b>ORGANIC TOTALS</b>	<b>803.3</b>	<b>86.8</b>	<b>66.9</b>	<b>7.2</b>	<b>26.83%</b>	<b>13.68%</b>
Fines	58.0	7.0	4.8	0.6	1.94%	1.10%
Other Inorganics	68.0	8.2	5.7	0.7	2.27%	1.29%
<b>INORGANIC TOTALS</b>	<b>126.0</b>	<b>15.2</b>	<b>10.5</b>	<b>1.3</b>	<b>4.21%</b>	<b>2.40%</b>
<b>OTHER WASTE</b>	<b>11.0</b>	<b>0.5</b>	<b>0.9</b>	<b>0.04</b>	<b>0.37%</b>	<b>0.08%</b>
<b>GRAND TOTAL</b>	<b>2994.1</b>	<b>634.5</b>	<b>249.5</b>	<b>52.9</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 16-2



## **SORT #2**

### **Sort Conditions**

The second sort was conducted May 5-6, 1997. The sort location was the same as Sort #1. The weather was sunny and mild.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	30,769
Total Sample Weight (lbs)	2199.7
Significance Test Results	.000
Number of Samples Collected	10

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	1	Beauty/Hygiene Aerosol Products	0
Prescription Medication (Rx)	3	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	2	Gardening/Yard Care Products	0
Household Cleaning Products	0	Pet Groom Products	0
Sharps/Blades	0	Disposable Razors	6
Syringes	4	Alkaline Batteries	5
Hardware/Shop Products	0	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	0		
Miscellaneous items: None.			
Total Weight (lb): 2.0 Total Volume (cubic ft.): .1			

**TABLE 16-3**

**CITY OF WEST PLAINS TRANSFER STATION  
SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	202.3	51.3	0%	100%	Curbside/Drop-off	West Plains
2	226	42.3	50%	50%	Curbside/Drop-off	West Plains
3	219.6	46.8	90%	10%	Curbside/Drop-off	West Plains
4	255.7	48.4	90%	10%	Curbside/Drop-off	West Plains
5	170.7	42.6	50%	50%	Curbside/Drop-off	West Plains
6	239.2	48.9	50%	50%	Curbside/Drop-off	West Plains
7	187.9	43.4	50%	50%	Curbside/Drop-off	Willow Springs
8	314.3	55.8	90%	10%	Curbside/Drop-off	West Plains
9	195.1	47	100%	0%	Curbside/Drop-off	West Plains
10	188.9	49.8	100%	0%	Curbside/Drop-off	West Plains
<b>TOTALS</b>	<b>2199.7</b>	<b>476.3</b>				
<b>AVERAGE</b>	<b>219.97</b>	<b>47.6</b>	<b>67%</b>	<b>33%</b>		

TABLE 16-3



**CITY OF WEST PLAINS TRANSFER STATION**

**SORT # 2**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	137.4	50.5	13.7	5.1	6.25%	10.60%
Newsprint	90.8	22.0	9.1	2.2	4.13%	4.62%
Magazines	75.0	10.6	7.5	1.1	3.41%	2.22%
High Grade	114.1	25.0	11.4	2.5	5.19%	5.25%
Mixed	364.1	83.7	36.4	8.4	16.55%	17.56%
<b>PAPER TOTALS</b>	<b>781.4</b>	<b>191.8</b>	<b>78.1</b>	<b>19.2</b>	<b>35.52%</b>	<b>40.24%</b>
Clear	55.2	6.2	5.5	0.6	2.51%	1.30%
Brown	32.5	4.1	3.3	0.4	1.48%	0.86%
Green	11.4	1.0	1.1	0.1	0.52%	0.21%
Other	11.8	1.0	1.2	0.1	0.54%	0.21%
<b>GLASS TOTALS</b>	<b>110.9</b>	<b>12.3</b>	<b>11.1</b>	<b>1.2</b>	<b>5.04%</b>	<b>2.58%</b>
Alum. Cans	26.9	7.5	2.7	0.8	1.22%	1.57%
Other Alum	18.6	3.5	1.9	0.4	0.85%	0.73%
Non ferrous	8.7	0.8	0.9	0.1	0.40%	0.17%
Food Cans	73.2	14.0	7.3	1.4	3.33%	2.94%
Ferrous	17.2	1.6	1.7	0.2	0.78%	0.34%
Oil Filters	3.2	0.1	0.3	0.0	0.15%	0.02%
<b>METAL TOTALS</b>	<b>147.8</b>	<b>27.5</b>	<b>14.8</b>	<b>2.8</b>	<b>6.72%</b>	<b>5.77%</b>
PET # 1	37.9	15.5	3.8	1.6	1.72%	3.25%
HDPE # 2	57.5	21.6	5.8	2.2	2.61%	4.53%
Film	93.3	53.0	9.3	5.3	4.24%	11.12%
Other Plastic	192.6	65.5	19.3	6.6	8.76%	13.74%
<b>PLASTIC TOTALS</b>	<b>381.3</b>	<b>155.6</b>	<b>38.1</b>	<b>15.6</b>	<b>17.33%</b>	<b>32.65%</b>
Food Waste	414.9	43.8	41.5	4.4	18.86%	9.19%
Wood Waste	15.5	2.0	1.6	0.2	0.70%	0.42%
Textiles	47.9	11.3	4.8	1.1	2.18%	2.37%
Diapers	83.3	8.1	8.3	0.8	3.79%	1.70%
Other Organics	163.4	18.6	16.3	1.9	7.43%	3.90%
<b>ORGANIC TOTALS</b>	<b>725.0</b>	<b>83.8</b>	<b>72.5</b>	<b>8.4</b>	<b>32.96%</b>	<b>17.58%</b>
Fines	29.5	3.8	3.0	0.4	1.34%	0.80%
Other Inorganics	21.8	1.7	2.2	0.2	0.99%	0.36%
<b>INORGANIC TOTALS</b>	<b>51.3</b>	<b>5.5</b>	<b>5.1</b>	<b>0.6</b>	<b>2.33%</b>	<b>1.15%</b>
<b>OTHER WASTE</b>	<b>2.0</b>	<b>0.1</b>	<b>0.2</b>	<b>0.01</b>	<b>0.09%</b>	<b>0.02%</b>
<b>GRAND TOTAL</b>	<b>2199.7</b>	<b>476.6</b>	<b>220.0</b>	<b>47.7</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 16-4



### **SORT # 3**

#### **Sort Conditions**

The third sort was conducted October 6-8, 1997. The sort location was the same as the previous sort. The weather was overcast and mild.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	30,769
<b>Total Sample Weight (lbs)</b>	2189.9
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	0	<b>Beauty/Hygiene Aerosol Products</b>	2
<b>Prescription Medication (Rx)</b>	1	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	20	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	0	<b>Pet Groom Products</b>	1
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	20
<b>Syringes</b>	23	<b>Alkaline Batteries</b>	16
<b>Hardware/Shop Products</b>	0	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	2		
<b>Miscellaneous items:</b> 1 partial container of tar, 1 package of firecrackers, 2 containers of sodium chloride solution, 1 bottle of endozyme solution.			
<b>Total Weight (lb): 10.2</b> <b>Total Volume (cubic ft.): .3</b>			



**CITY OF WEST PLAINS TRANSFER STATION**  
**SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	223.1	57.8	50%	50%	Curbside/Drop-off	West Plains
2	223.5	47.3	50%	50%	Curbside/Drop-off	West Plains
3	199.1	38.3	25%	75%	Curbside/Drop-off	West Plains
4	97.4	30.4	50%	50%	Curbside/Drop-off	West Plains
5	176.6	38.3	50%	50%	Curbside/Drop-off	West Plains
6	218.1	53	75%	25%	Curbside/Drop-off	West Plains
7	147.8	39.8	75%	25%	Curbside/Drop-off	West Plains
8	99.8	35.4	50%	50%	Curbside/Drop-off	Willow Springs
9	206.4	53	80%	20%	Curbside/Drop-off	West Plains
10	205.2	43.9	75%	25%	Curbside/Drop-off	West Plains
11	172.2	38.8	75%	25%	Curbside/Drop-off	West Plains
12	220.8	37.1	75%	25%	Curbside/Drop-off	West Plains
<b>TOTALS</b>	<b>2189.9</b>	<b>512.1</b>				
<b>AVERAGE</b>	<b>182.4917</b>	<b>42.7</b>	<b>61%</b>	<b>39%</b>		

TABLE 16-5



## CITY OF WEST PLAINS TRANSFER STATION

SORT # 3

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	115.0	62.3	9.6	5.2	5.25%	12.15%
Newsprint	97.2	24.7	8.1	2.1	4.44%	4.81%
Magazines	104.8	5.0	8.7	0.4	4.79%	0.97%
High Grade	226.9	42.5	18.9	3.5	10.36%	8.28%
Mixed	448.3	103.3	37.4	8.6	20.47%	20.16%
<b>PAPER TOTALS</b>	<b>992.1</b>	<b>237.6</b>	<b>82.7</b>	<b>19.8</b>	<b>45.30%</b>	<b>46.36%</b>
Clear	51.9	3.6	4.3	0.3	2.37%	0.70%
Brown	16.2	1.7	1.3	0.1	0.74%	0.33%
Green	9.6	1.1	0.8	0.1	0.44%	0.21%
Other	9.8	1.1	0.8	0.1	0.45%	0.21%
<b>GLASS TOTALS</b>	<b>87.5</b>	<b>7.5</b>	<b>7.3</b>	<b>0.6</b>	<b>3.99%</b>	<b>1.46%</b>
Alum. Cans	31.8	12.7	2.6	1.1	1.45%	2.48%
Other Alum	12.5	5.6	1.0	0.5	0.57%	1.08%
Non ferrous	0.4	0.4	0.0	0.0	0.02%	0.07%
Food Cans	56.8	10.7	4.7	0.9	2.59%	2.08%
Ferrous	16.6	2.0	1.4	0.2	0.76%	0.39%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>118.1</b>	<b>31.3</b>	<b>9.8</b>	<b>2.6</b>	<b>5.39%</b>	<b>6.10%</b>
PET # 1	36.0	20.3	3.0	1.7	1.64%	3.96%
HDPE # 2	40.0	19.6	3.3	1.6	1.83%	3.81%
Film	108.7	54.8	9.1	4.6	4.96%	10.68%
Other Plastic	167.4	83.7	14.0	7.0	7.64%	16.32%
<b>PLASTIC TOTALS</b>	<b>352.0</b>	<b>178.3</b>	<b>29.3</b>	<b>14.9</b>	<b>16.07%</b>	<b>34.78%</b>
Food Waste	403.0	31.2	33.6	2.6	18.40%	6.09%
Wood Waste	6.8	1.8	0.6	0.2	0.31%	0.35%
Textiles	40.4	7.0	3.4	0.6	1.84%	1.37%
Diapers	58.8	6.5	4.9	0.5	2.69%	1.27%
Other Organics	21.7	2.9	1.8	0.2	0.99%	0.57%
<b>ORGANIC TOTALS</b>	<b>530.6</b>	<b>49.4</b>	<b>44.2</b>	<b>4.1</b>	<b>24.23%</b>	<b>9.64%</b>
Fines	96.2	7.7	8.0	0.6	4.39%	1.50%
Other Inorganics	3.3	0.4	0.3	0.0	0.15%	0.08%
<b>INORGANIC TOTALS</b>	<b>99.5</b>	<b>8.1</b>	<b>8.3</b>	<b>0.7</b>	<b>4.54%</b>	<b>1.58%</b>
<b>OTHER WASTE</b>	<b>10.2</b>	<b>0.4</b>	<b>0.9</b>	<b>0.0</b>	<b>0.47%</b>	<b>0.07%</b>
<b>GRAND TOTAL</b>	<b>2189.9</b>	<b>512.5</b>	<b>182.5</b>	<b>42.7</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 16-6



## **SORT SUMMARY**

### **Seasonal variations**

- Mixed paper totals were larger due to the large amounts of routes containing fast food restaurants, businesses, and schools.
- Food waste (not fast food) was larger. There is a tendency for rural areas to use more traditional food, while fast food and convenience food waste is larger in urban areas.
- Organics was larger in the second round of sorts due to several bags of yard waste. Yard waste is officially banned but not totally absent from the waste stream

### **Sort results**

- Chart 16-1 graphically compares the three seasonal sort results and shows the average waste composition, by major category, for West Plains.
- The sample data for all West Plains waste sorts are listed on Table 16-7.
- The sort results for West Plains are listed on Table 16-8.
- The summary of statistical relevance for the West Plains sorts is located on page 260.
- The total for all “other wastes” found during the West Plains sorts is on page 260.

**All weights are in pounds and volumes are listed in cubic feet.**

Comparisons of the West Plains’ waste stream to previous studies and other communities can be found in Chapter 24.

## WEST PLAINS RESULTS BY WEIGHT

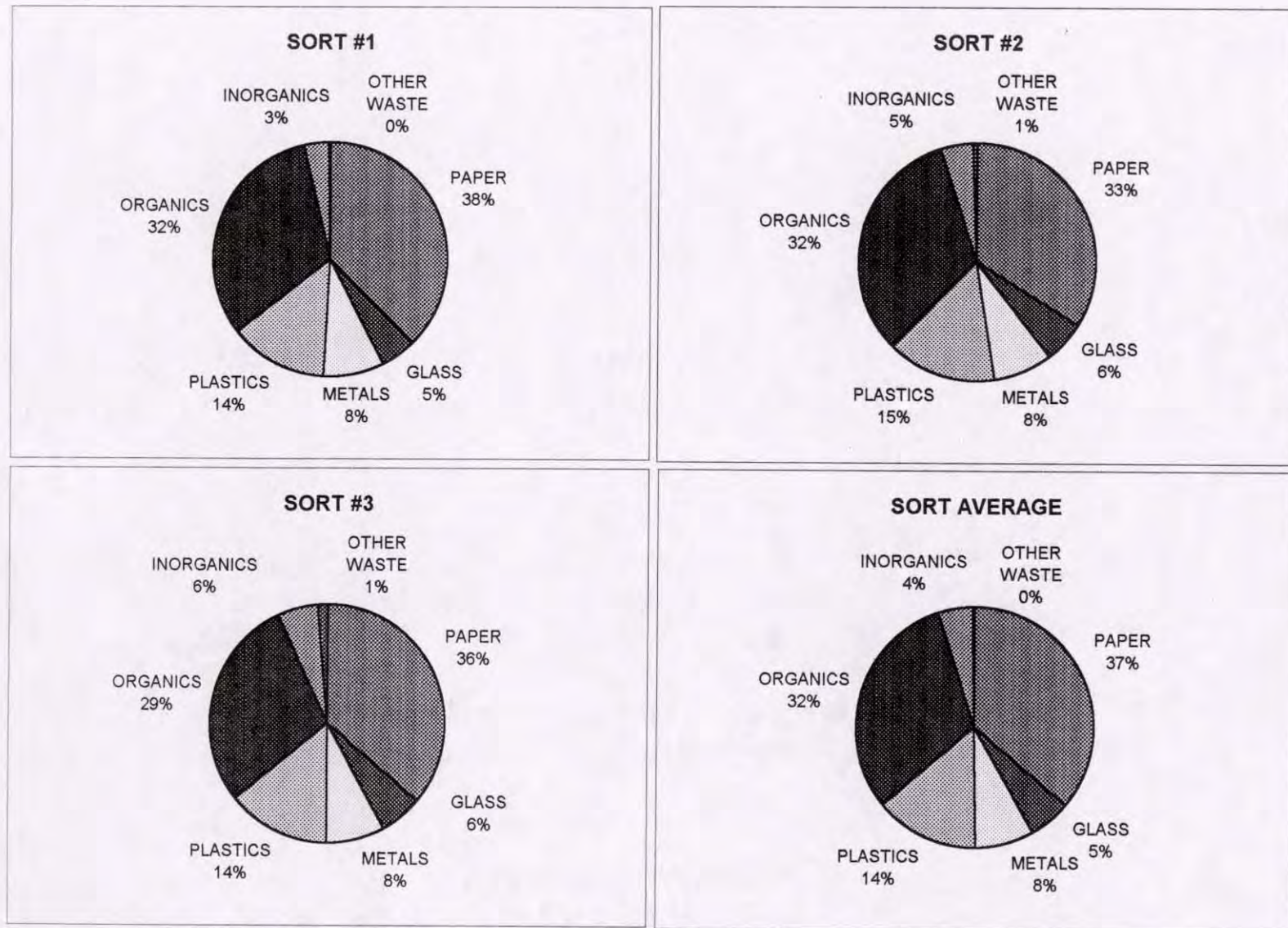


CHART 16-1



# WEST PLAINS SAMPLE SUMMARY

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	2/10-2/11	12	2994.1	634.5	53%	47%
2	5/5-5/6	10	2199.7	476.3	67%	33%
3	10/6-10/8	12	2189.9	512.1	61%	39%
<b>TOTALS</b>		<b>34.0</b>	<b>7383.7</b>	<b>1622.9</b>		
<b>AVERAGE</b>		<b>11.3</b>	<b>2461.2</b>	<b>541.0</b>	<b>60%</b>	<b>40%</b>

TABLE 16-7

CATEGORY	WEST PLAINS						SUMMARY	
	SORT # 1		SORT # 2		SORT #3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	5.7%	9.6%	6.2%	10.6%	5.3%	12.2%	5.7%	10.7%
Newsprint	4.0%	3.2%	4.1%	4.6%	4.4%	4.8%	4.2%	4.1%
Magazines	3.1%	1.5%	3.4%	2.2%	4.8%	1.0%	3.7%	1.6%
High Grade	9.4%	8.8%	5.2%	5.2%	10.4%	8.3%	8.4%	7.6%
Mixed	17.6%	20.2%	16.6%	17.6%	20.5%	20.2%	18.2%	19.4%
<b>PAPER TOTALS</b>	<b>39.7%</b>	<b>43.2%</b>	<b>35.5%</b>	<b>40.2%</b>	<b>45.3%</b>	<b>46.4%</b>	<b>40.1%</b>	<b>43.3%</b>
Clear	2.1%	0.7%	2.5%	1.3%	2.4%	0.7%	2.3%	0.9%
Brown	0.6%	0.2%	1.5%	0.9%	0.7%	0.3%	0.9%	0.4%
Green	0.6%	0.2%	0.5%	0.2%	0.4%	0.2%	0.5%	0.2%
Other	0.6%	0.3%	0.5%	0.2%	0.4%	0.2%	0.5%	0.2%
<b>GLASS TOTALS</b>	<b>3.9%</b>	<b>1.3%</b>	<b>5.0%</b>	<b>2.6%</b>	<b>4.0%</b>	<b>1.5%</b>	<b>4.3%</b>	<b>1.7%</b>
Alum. Cans	1.8%	3.0%	1.2%	1.6%	1.5%	2.5%	1.5%	2.4%
Other Alum	1.0%	1.1%	0.8%	0.7%	0.6%	1.1%	0.8%	1.0%
Non ferrous	0.4%	0.3%	0.4%	0.2%	0.0%	0.1%	0.3%	0.2%
Food Cans	3.1%	1.9%	3.3%	2.9%	2.6%	2.1%	3.0%	2.3%
Ferrous	1.0%	0.7%	0.8%	0.3%	0.8%	0.4%	0.9%	0.5%
Oil Filters	0.8%	0.2%	0.1%	0.0%	0.0%	0.0%	0.4%	0.1%
<b>METAL TOTALS</b>	<b>7.9%</b>	<b>7.2%</b>	<b>6.7%</b>	<b>5.8%</b>	<b>5.4%</b>	<b>6.1%</b>	<b>6.8%</b>	<b>6.4%</b>
PET # 1	1.7%	3.4%	1.7%	3.3%	1.6%	4.0%	1.7%	3.5%
HDPE # 2	1.8%	3.0%	2.6%	4.5%	1.8%	3.8%	2.0%	3.7%
Film	5.1%	10.5%	4.2%	11.1%	5.0%	10.7%	4.8%	10.7%
Other Plastic	8.4%	15.3%	8.8%	13.7%	7.6%	16.3%	8.3%	15.2%
<b>PLASTIC TOTALS</b>	<b>17.0%</b>	<b>32.1%</b>	<b>17.3%</b>	<b>32.6%</b>	<b>16.1%</b>	<b>34.8%</b>	<b>16.8%</b>	<b>33.1%</b>
Food Waste	18.3%	8.5%	18.9%	9.2%	18.4%	6.1%	18.5%	8.0%
Wood Waste	1.2%	0.6%	0.7%	0.4%	0.3%	0.4%	0.8%	0.5%
Textiles	2.7%	2.1%	2.2%	2.4%	1.8%	1.4%	2.3%	2.0%
Diapers	3.4%	1.6%	3.8%	1.7%	2.7%	1.3%	3.3%	1.5%
Other Organics	1.3%	0.8%	7.4%	3.9%	1.0%	0.6%	3.0%	1.6%
<b>ORGANIC TOTALS</b>	<b>26.8%</b>	<b>13.7%</b>	<b>33.0%</b>	<b>17.6%</b>	<b>24.2%</b>	<b>9.6%</b>	<b>27.9%</b>	<b>13.6%</b>
Fines	1.9%	1.1%	1.3%	0.8%	4.4%	1.5%	2.5%	1.1%
Other Inorganics	2.3%	1.3%	1.0%	0.4%	0.2%	0.1%	1.3%	0.6%
<b>INORGANIC TOTALS</b>	<b>4.2%</b>	<b>2.4%</b>	<b>2.3%</b>	<b>1.2%</b>	<b>4.5%</b>	<b>1.6%</b>	<b>3.7%</b>	<b>1.8%</b>
<b>OTHER WASTE</b>	<b>0.4%</b>	<b>0.1%</b>	<b>0.1%</b>	<b>0.02%</b>	<b>1.0%</b>	<b>0.2%</b>	<b>0.3%</b>	<b>0.1%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 16-8



West Plains Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	92,307
Total Sample Weight (lbs)	7383.7
Significance Test Results	.000
Number of Samples Collected	34
Mean Sample (lbs) and Confidence Interval (95%)	216.49 (+/-) 17.08

West Plains "Other Waste" Summary			
Over-the-counter Medication (OTC)	1	Beauty/Hygiene Aerosol Products	2
Prescription Medication (Rx)	10	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	25	Gardening/Yard Care Products	0
Household Cleaning Products	0	Pet Groom Products	1
Sharps/Blades	2	Disposable Razors	35
Syringes	39	Alkaline Batteries	28
Hardware/Shop Products	2	Automobile Maintenance/Cleaning Products	1
Aerosol Cans	3		
Miscellaneous items: IV bags with saline solution, 4 bags of ice gel, 1 partial container of tar, 1 package of firecrackers, 2 containers of sodium chloride solution, 1 bottle of endozyme solution.			
Total Weight (lb): 23.2 Total Volume (cubic ft.): .8			

## Chapter 17: Rolla

### COMMUNITY PROFILE

The City of Rolla is part of Phelps County and is part of the Northern Ozark area in central Missouri. The city is a base for agriculture, service, and manufacturing; and it is also the home of the University of Missouri-Rolla. Rolla is part of the Ozark Rivers Solid Waste Management District (District K). Phelps County Transfer Station is located along I-44 a few miles east of Rolla city limits. The transfer station receives solid waste from Phelps and surrounding counties. Rolla is located on Interstate 44 and is 106 miles southwest of St. Louis, 110 miles northeast of Springfield, and 210 miles southeast of Kansas City.

#### Demographics:

	<b>Rolla</b>	<b>Phelps County</b>
Area (sq. miles)	8.04	672.78
Population (1990)	14,090	35,248
Density (per sq. mile)	1752.17	52.39
Pop. Change since 1980	5.9%	4.8%
Number of households	5,262	13,273
Persons per household	2.30	2.46
High school graduates	27.5%	32.9%
Median Family Income	\$26,982	\$26,428
Percent below poverty level	22.4%	18.5%



### **Solid Waste Collection**

The cities of Rolla and St. James have both public and private haulers. The curbside programs for both cities are voluntary and everyone pays the same rate for this service.

### **Solid Waste Disposal**

Phelps County Transfer Station is owned and operated by Waste Management, Inc. The solid waste collected at the facility is transferred to the Hartsville Landfill in Wright County. The facility receives approximately 50,000 tons of waste per year, and the current tipping fee is \$43.81 per ton.

### **Waste Reduction and Recycling Programs**

The Cities of Rolla and St. James offer curbside recycling, and Rolla has a drop-off center for the public. District K provides recycling educational programs through schools, a resource center, radio programs, and a monthly news column. There is currently no household hazardous waste facility. Fees for recycling programs are incorporated into the solid waste collection fees for Rolla and St. James. Trash and recycling cost approximately \$12.50 per month in Rolla and \$9.35 in St. James. It is estimated that all recycling programs received a total of 2,000 tons of recyclable material per year.

### **Phelps County Transfer Station Results**

Information about sample size and composition are listed in tables 17-1 to 17-8.

**All weights are listed in pounds and all volumes are in cubic feet.**



## **SORT #1**

### **Sort Conditions**

The first sort was conducted April 7-8, 1997. An area to the bottom of the transfer station was designated for sort activities. The weather was sunny and cool.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	769,231
<b>Total Sample Weight (lbs)</b>	2585.7
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	1	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	9	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	8	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	1	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	1	<b>Disposable Razors</b>	11
<b>Syringes</b>	1	<b>Alkaline Batteries</b>	16
<b>Hardware/Shop Products</b>	0	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> 2 containers of tar/asphalt, 1 container of bubble solution.			
<b>Total Weight (lb): 26.2</b>			
<b>Total Volume (cubic ft.): 1.0</b>			

**TABLE 17-1**



# **PHELPS COUNTY TRANSFER STATION (ROLLA)**

## **SORT # 1**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	229.6	39.8	80%	20%	Drop-off	Vienna (in-town)
2	207	47.3	50%	50%	Curbside	Sullivan (suburb)
3	236.3	47.7	90%	10%	Curbside/Drop-off	Dixon
4	201.3	54.9	90%	10%	Curbside/Drop-off	Dixon
5	170.7	33.5	80%	20%	Curbside	Owensville
6	207.3	50.4	90%	10%	Curbside/Drop-off	Rolla
7	209.5	45.2	80%	20%	Curbside/Drop-off	Rolla
8	237.5	43.1	100%	0%	Curbside/Drop-off	Rolla
9	199.1	49.7	90%	10%	Curbside/Drop-off	Rolla (rural)
10	193.4	47.3	100%	0%	Curbside	Owensville and Bourbon
11	229.8	45.3	100%	0%	Curbside	Owensville and Bourbon
12	264.2	43.1	100%	0%	Curbside	Owensville and Bourbon
<b>TOTALS</b>	<b>2585.7</b>	<b>547.1</b>				
<b>AVERAGE</b>	<b>215.475</b>	<b>45.6</b>	<b>88%</b>	<b>12%</b>		

TABLE 17-1



**PHELPS COUNTY TRANSFER STATION (ROLLA)**

**SORT # 1**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	180.0	57.3	15.0	4.8	6.96%	10.47%
Newsprint	226.4	43.5	18.9	3.6	8.76%	7.95%
Magazines	89.9	11.6	7.5	1.0	3.48%	2.12%
High Grade	86.0	17.3	7.2	1.4	3.33%	3.16%
Mixed	370.2	96.5	30.9	8.0	14.32%	17.64%
<b>PAPER TOTALS</b>	<b>952.5</b>	<b>226.2</b>	<b>79.4</b>	<b>18.9</b>	<b>36.84%</b>	<b>41.35%</b>
Clear	96.6	10.0	8.1	0.8	3.74%	1.83%
Brown	53.6	7.0	4.5	0.6	2.07%	1.28%
Green	7.0	0.5	0.6	0.0	0.27%	0.09%
Other	19.0	2.2	1.6	0.2	0.73%	0.40%
<b>GLASS TOTALS</b>	<b>176.2</b>	<b>19.7</b>	<b>14.7</b>	<b>1.6</b>	<b>6.82%</b>	<b>3.60%</b>
Alum. Cans	43.7	17.0	3.6	1.4	1.69%	3.11%
Other Alum	19.9	4.5	1.7	0.4	0.77%	0.82%
Non ferrous	4.8	0.5	0.4	0.0	0.19%	0.09%
Food Cans	87.8	16.5	7.3	1.4	3.40%	3.02%
Ferrous	23.8	3.5	2.0	0.3	0.92%	0.64%
Oil Filters	2.0	0.1	0.2	0.0	0.08%	0.02%
<b>METAL TOTALS</b>	<b>182.0</b>	<b>42.1</b>	<b>15.2</b>	<b>3.5</b>	<b>7.04%</b>	<b>7.70%</b>
PET # 1	42.7	18.6	3.6	1.6	1.65%	3.40%
HDPE # 2	48.3	21.9	4.0	1.8	1.87%	4.00%
Film	107.7	56.5	9.0	4.7	4.17%	10.33%
Other Plastic	159.1	60.6	13.3	5.1	6.15%	11.08%
<b>PLASTIC TOTALS</b>	<b>357.8</b>	<b>157.6</b>	<b>29.8</b>	<b>13.1</b>	<b>13.84%</b>	<b>28.81%</b>
Food Waste	577.8	57.0	48.2	4.8	22.35%	10.42%
Wood Waste	18.7	6.2	1.6	0.5	0.72%	1.13%
Textiles	47.5	9.7	4.0	0.8	1.84%	1.77%
Diapers	82.5	10.6	6.9	0.9	3.19%	1.94%
Other Organics	117.1	12.3	9.8	1.0	4.53%	2.25%
<b>ORGANIC TOTALS</b>	<b>843.6</b>	<b>95.8</b>	<b>70.3</b>	<b>8.0</b>	<b>32.63%</b>	<b>17.51%</b>
Fines	38.9	4.2	3.2	0.4	1.50%	0.77%
Other Inorganics	8.2	0.5	0.7	0.0	0.32%	0.09%
<b>INORGANIC TOTALS</b>	<b>47.1</b>	<b>4.7</b>	<b>3.9</b>	<b>0.4</b>	<b>1.82%</b>	<b>0.86%</b>
<b>OTHER WASTE</b>	<b>26.2</b>	<b>1.0</b>	<b>2.2</b>	<b>0.1</b>	<b>1.01%</b>	<b>0.18%</b>
<b>GRAND TOTAL</b>	<b>2585.4</b>	<b>547.1</b>	<b>215.4</b>	<b>45.6</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 17-2



## **SORT #2**

### **Sort Conditions**

The second sort was conducted May 15-16, 1997. The same sort area was used as in Sort #1. The weather was sunny and very warm.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	769,231
Total Sample Weight (lbs)	1746.8
Significance Test Results	.000
Number of Samples Collected	10

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	1	Beauty/Hygiene Aerosol Products	2
Prescription Medication (Rx)	3	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	0	Gardening/Yard Care Products	0
Household Cleaning Products	1	Pet Groom Products	0
Sharps/Blades	0	Disposable Razors	4
Syringes	37	Alkaline Batteries	4
Hardware/Shop Products	1	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	1		
Miscellaneous items: None.			
Total Weight (1b): 3.5			
Total Volume (cubic ft.): .5			



# **PHELPS COUNTY TRANSFER STATION (ROLLA)**

## **SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	203.4	56.7	100%	0%	Curbside/Drop-off	Rolla
2	179.2	46.8	100%	0%	Curbside/Drop-off	Rolla
3	218.4	46.6	100%	0%	Curbside/Drop-off	Rolla
4	164.5	52.1	100%	0%	Curbside/Drop-off	Rolla
5	143	49.8	100%	0%	Curbside/Drop-off	Rolla
6	181.9	50.1	100%	0%	Curbside/Drop-off	Rolla
7	177.3	42.7	50%	50%	Curbside	St. James (city limits)
8	183.5	45.3	100%	0%	Curbside	St. James (city limits)
9	152.9	47.6	50%	50%	Drop-off	Salem
10	142.7	40.3	50%	50%	Drop-off	Salem
<b>TOTALS</b>	<b>1746.8</b>	<b>477.5</b>				
<b>AVERAGE</b>	<b>174.68</b>	<b>47.8</b>	<b>85%</b>	<b>15%</b>		

TABLE 17-3



**PHELPS COUNTY TRANSFER STATION (ROLLA)      SORT # 2**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	116.1	50.7	11.6	5.1	6.65%	10.62%
Newsprint	97.1	24.6	9.7	2.5	5.56%	5.15%
Magazines	73.4	9.1	7.3	0.9	4.20%	1.91%
High Grade	134.6	27.8	13.5	2.8	7.71%	5.82%
Mixed	184.3	69.5	18.4	7.0	10.55%	14.55%
<b>PAPER TOTALS</b>	<b>605.5</b>	<b>181.7</b>	<b>60.6</b>	<b>18.2</b>	<b>34.67%</b>	<b>38.05%</b>
Clear	49.4	3.7	4.9	0.4	2.83%	0.77%
Brown	32.1	3.4	3.2	0.3	1.84%	0.71%
Green	9.0	0.8	0.9	0.1	0.52%	0.17%
Other	6.5	1.5	0.7	0.2	0.37%	0.31%
<b>GLASS TOTALS</b>	<b>97.0</b>	<b>9.4</b>	<b>9.7</b>	<b>0.9</b>	<b>5.55%</b>	<b>1.97%</b>
Alum. Cans	15.7	7.4	1.6	0.7	0.90%	1.55%
Other Alum	7.4	3.5	0.7	0.4	0.42%	0.73%
Non ferrous	6.0	5.2	0.6	0.5	0.34%	1.09%
Food Cans	50.6	13.0	5.1	1.3	2.90%	2.72%
Ferrous	19.0	4.5	1.9	0.5	1.09%	0.94%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>98.7</b>	<b>33.6</b>	<b>9.9</b>	<b>3.4</b>	<b>5.65%</b>	<b>7.04%</b>
PET # 1	28.1	16.5	2.8	1.7	1.61%	3.46%
HDPE # 2	35.5	23.8	3.6	2.4	2.03%	4.98%
Film	57.6	47.5	5.8	4.8	3.30%	9.95%
Other Plastic	122.4	67.4	12.2	6.7	7.01%	14.12%
<b>PLASTIC TOTALS</b>	<b>243.6</b>	<b>155.2</b>	<b>24.4</b>	<b>15.5</b>	<b>13.95%</b>	<b>32.50%</b>
Food Waste	428.0	49.0	42.8	4.9	24.51%	10.26%
Wood Waste	4.3	1.9	0.4	0.2	0.25%	0.40%
Textiles	101.1	19.2	10.1	1.9	5.79%	4.02%
Diapers	63.1	7.1	6.3	0.7	3.61%	1.49%
Other Organics	46.1	9.4	4.6	0.9	2.64%	1.97%
<b>ORGANIC TOTALS</b>	<b>642.6</b>	<b>86.6</b>	<b>64.3</b>	<b>8.7</b>	<b>36.80%</b>	<b>18.14%</b>
Fines	35.9	8.5	3.6	0.9	2.06%	1.78%
Other Inorganics	19.5	2.0	2.0	0.2	1.12%	0.42%
<b>INORGANIC TOTALS</b>	<b>55.4</b>	<b>10.5</b>	<b>5.5</b>	<b>1.1</b>	<b>3.17%</b>	<b>2.20%</b>
<b>OTHER WASTE</b>	<b>3.5</b>	<b>0.5</b>	<b>0.4</b>	<b>0.1</b>	<b>0.20%</b>	<b>0.10%</b>
<b>GRAND TOTAL</b>	<b>1746.3</b>	<b>477.5</b>	<b>174.6</b>	<b>47.8</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 17-4



### **SORT #3**

#### **Sort Conditions**

The third sort was conducted September 29- October 1, 1997. The same sort area was used as in the previous sort. The weather was sunny and very warm.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	769,231
<b>Total Sample Weight (lbs)</b>	2257.0
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	11

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	1	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	1	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	1	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	3	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	8
<b>Syringes</b>	2	<b>Alkaline Batteries</b>	17
<b>Hardware/Shop Products</b>	1	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	1		
<b>Miscellaneous items:</b> 1/2 bag of water softener.			
<b>Total Weight (lb): 15.25</b>			
<b>Total Volume (cubic ft.): 1.2</b>			



**PHELPS COUNTY TRANSFER STATION (ROLLA)**  
**SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	194.7	46	100%	0%	Curbside/Drop-off	Phelps County (rural)
2	241.5	48.6	100%	0%	None	Bland
3	252.5	50.5	95%	5%	Curbside	Vichy, St. James (rural)
4	217.2	46.1	95%	5%	Curbside	Vichy, St. James (rural)
5	246.8	53.5	100%	0%	None	St. James, Vichy, High Gate (rural)
6	214.6	35.5	60%	40%	Curbside	Owensville
7	178.4	33.3	60%	40%	Curbside	Owensville
8	219.5	46.9	80%	20%	Curbside/Drop-off	Rolla (college and school)
9	181.2	33.7	90%	10%	Curbside/Drop-off	Rolla
10	133	34.8	90%	10%	Curbside/Drop-off	Rolla
11	177.5	37.7	90%	10%	Curbside/Drop-off	Rolla
<b>TOTALS</b>	<b>2257</b>	<b>466.5</b>				
<b>AVERAGE</b>	<b>205.1818</b>	<b>42.4</b>	<b>87%</b>	<b>13%</b>		

TABLE 17-5



**PHELPS COUNTY TRANSFER STATION (ROLLA)****SORT # 3**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	160.2	59.9	14.6	5.4	7.10%	12.83%
Newsprint	161.6	26.8	14.7	2.4	7.16%	5.73%
Magazines	88.8	5.2	8.1	0.5	3.93%	1.11%
High Grade	59.2	15.2	5.4	1.4	2.62%	3.26%
Mixed	292.5	74.7	26.6	6.8	12.96%	16.00%
<b>PAPER TOTALS</b>	<b>762.1</b>	<b>181.7</b>	<b>69.3</b>	<b>16.5</b>	<b>33.77%</b>	<b>38.94%</b>
Clear	81.0	4.4	7.4	0.4	3.59%	0.94%
Brown	15.5	1.1	1.4	0.1	0.69%	0.24%
Green	9.0	0.9	0.8	0.1	0.40%	0.19%
Other	16.0	1.4	1.5	0.1	0.71%	0.30%
<b>GLASS TOTALS</b>	<b>121.5</b>	<b>7.8</b>	<b>11.0</b>	<b>0.7</b>	<b>5.38%</b>	<b>1.67%</b>
Alum. Cans	26.4	9.8	2.4	0.9	1.17%	2.09%
Other Alum	21.1	5.2	1.9	0.5	0.93%	1.11%
Non ferrous	1.9	0.4	0.2	0.0	0.08%	0.09%
Food Cans	83.0	14.4	7.5	1.3	3.68%	3.08%
Ferrous	28.2	3.1	2.6	0.3	1.25%	0.66%
Oil Filters	4.9	0.3	0.4	0.0	0.21%	0.06%
<b>METAL TOTALS</b>	<b>165.4</b>	<b>33.1</b>	<b>15.0</b>	<b>3.0</b>	<b>7.33%</b>	<b>7.10%</b>
PET # 1	35.1	15.6	3.2	1.4	1.56%	3.33%
HDPE # 2	45.8	26.3	4.2	2.4	2.03%	5.63%
Film	100.5	53.5	9.1	4.9	4.45%	11.47%
Other Plastic	167.9	68.0	15.3	6.2	7.44%	14.57%
<b>PLASTIC TOTALS</b>	<b>349.3</b>	<b>163.3</b>	<b>31.8</b>	<b>14.8</b>	<b>15.47%</b>	<b>34.99%</b>
Food Waste	453.1	32.9	41.2	3.0	20.08%	7.04%
Wood Waste	14.2	1.9	1.3	0.2	0.63%	0.41%
Textiles	107.1	20.7	9.7	1.9	4.75%	4.43%
Diapers	131.5	10.0	12.0	0.9	5.82%	2.14%
Other Organics	37.4	5.9	3.4	0.5	1.65%	1.26%
<b>ORGANIC TOTALS</b>	<b>743.2</b>	<b>71.3</b>	<b>67.6</b>	<b>6.5</b>	<b>32.93%</b>	<b>15.28%</b>
Fines	74.1	5.7	6.7	0.5	3.28%	1.21%
Other Inorganics	26.2	2.6	2.4	0.2	1.16%	0.55%
<b>INORGANIC TOTALS</b>	<b>100.3</b>	<b>8.2</b>	<b>9.1</b>	<b>0.7</b>	<b>4.44%</b>	<b>1.76%</b>
<b>OTHER WASTE</b>	<b>15.3</b>	<b>1.2</b>	<b>1.4</b>	<b>0.1</b>	<b>0.68%</b>	<b>0.26%</b>
<b>GRAND TOTAL</b>	<b>2257.0</b>	<b>466.5</b>	<b>205.2</b>	<b>42.4</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 17-6



## **SORT SUMMARY**

### **Seasonal variations**

- There was a marked increase in the amount of high grade paper in the second round.  
This was probably due to the University closing for the summer.
- Aluminum can totals were down during the second round, probably due to the decrease in student population for the summer.
- Diaper totals increased throughout the year.

### **Sort results**

- Chart 17-1 graphically compares the three seasonal sort results and shows the average waste composition, by major category, for Rolla.
- The sample data for all Rolla waste sorts are listed on Table 17-7.
- The sort results for Rolla are listed on Table 17-8.
- The summary of statistical relevance for the Rolla sorts is located on page 276.
- The total for all “other wastes” found during the Rolla sorts is on page 276.

**All weights are in pounds and volumes are listed in cubic feet.**

Comparisons of the Rolla’s waste stream to previous studies and other communities can be found in Chapter 24.

## ROLLA RESULTS BY WEIGHT

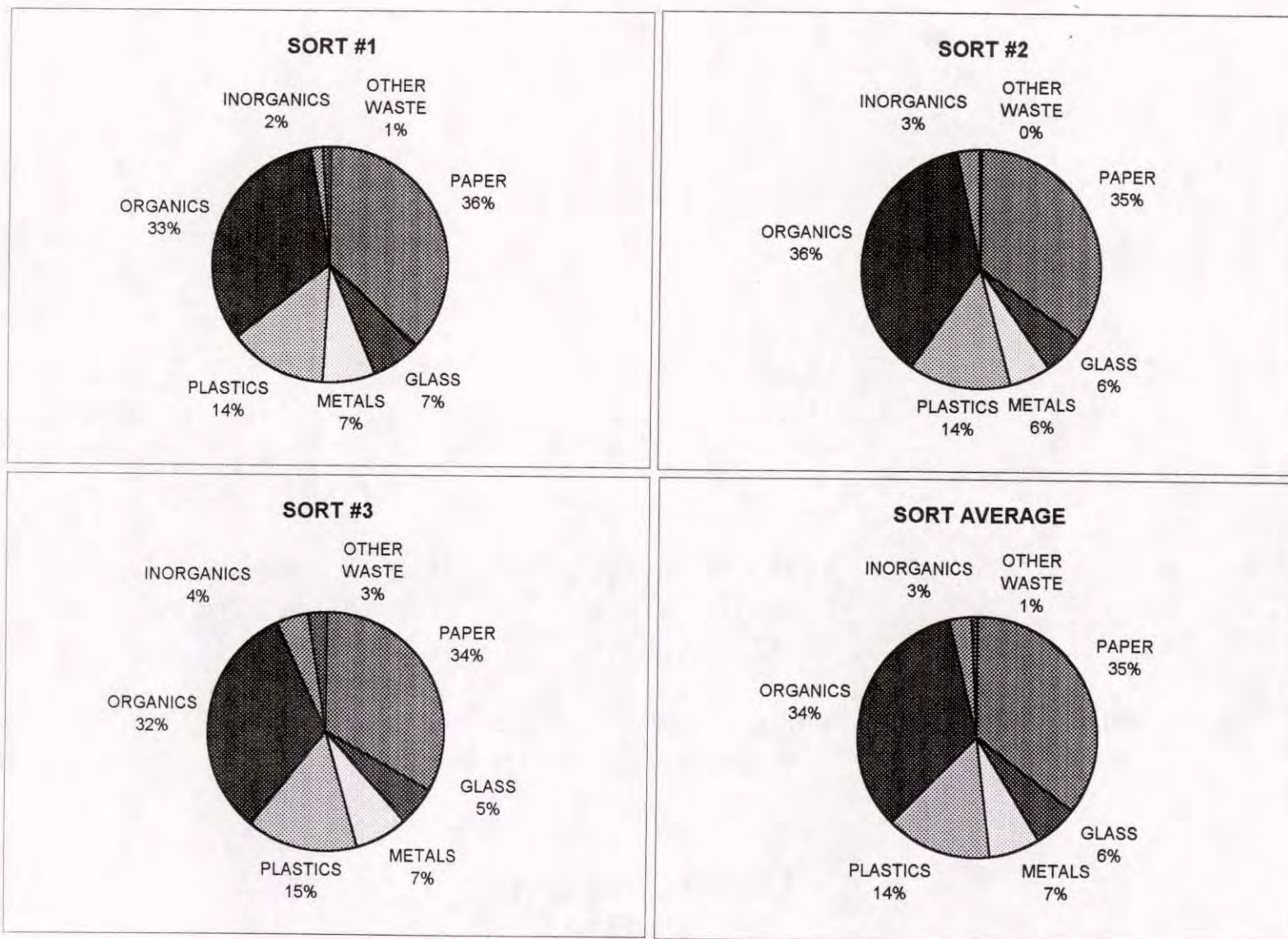


CHART 17-1



# **ROLLA SAMPLE SUMMARY**

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	4/7-4/8	12	2585.7	547.1	88%	12%
2	5/15-5/16	10	1746.8	477.5	85%	15%
3	9/29-10/1	11	2257.0	466.5	87%	13%
<b>TOTALS</b>		<b>33.0</b>	<b>6589.5</b>	<b>1491.1</b>		
<b>AVERAGE</b>		<b>11.0</b>	<b>2196.5</b>	<b>497.0</b>	<b>87%</b>	<b>13%</b>

TABLE 17-7



CATEGORY	ROLLA						SUMMARY	
	SORT # 1		SORT # 2		SORT # 3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	7.0%	10.5%	6.6%	10.6%	7.1%	12.8%	6.9%	11.3%
Newsprint	8.8%	8.0%	5.6%	5.2%	7.2%	5.7%	7.4%	6.4%
Magazines	3.5%	2.1%	4.2%	1.9%	3.9%	1.1%	3.8%	1.7%
High Grade	3.3%	3.2%	7.7%	5.8%	2.6%	3.3%	4.2%	4.0%
Mixed	14.3%	17.6%	10.6%	14.6%	13.0%	16.0%	12.9%	16.1%
PAPER TOTALS	36.8%	41.3%	34.7%	38.1%	33.8%	39.0%	35.2%	39.5%
Clear	3.7%	1.8%	2.8%	0.8%	3.6%	0.9%	3.4%	1.2%
Brown	2.1%	1.3%	1.8%	0.7%	0.7%	0.2%	1.5%	0.8%
Green	0.3%	0.1%	0.5%	0.2%	0.4%	0.2%	0.4%	0.1%
Other	0.7%	0.4%	0.4%	0.3%	0.7%	0.3%	0.6%	0.3%
GLASS TOTALS	6.8%	3.6%	5.6%	2.0%	5.4%	1.7%	6.0%	2.5%
Alum. Cans	1.7%	3.1%	0.9%	1.5%	1.2%	2.1%	1.3%	2.3%
Other Alum	0.8%	0.8%	0.4%	0.7%	0.9%	1.1%	0.7%	0.9%
Non ferrous	0.2%	0.1%	0.3%	1.1%	0.1%	0.1%	0.2%	0.4%
Food Cans	3.4%	3.0%	2.9%	2.7%	3.7%	3.1%	3.4%	2.9%
Ferrous	0.9%	0.6%	1.1%	0.9%	1.2%	0.7%	1.1%	0.7%
Oil Filters	0.1%	0.0%	0.0%	0.0%	0.2%	0.1%	0.1%	0.0%
METAL TOTALS	7.0%	7.7%	5.7%	7.0%	7.3%	7.1%	6.8%	7.3%
PET # 1	1.7%	3.4%	1.6%	3.5%	1.6%	3.3%	1.6%	3.4%
HDPE # 2	1.9%	4.0%	2.0%	5.0%	2.0%	5.6%	2.0%	4.8%
Film	4.2%	10.3%	3.3%	9.9%	4.5%	11.5%	4.0%	10.6%
Other Plastic	6.2%	11.1%	7.0%	14.1%	7.4%	14.6%	6.8%	13.1%
PLASTIC TOTALS	13.8%	28.8%	13.9%	32.5%	15.5%	35.0%	14.4%	33.1%
Food Waste	22.3%	10.4%	24.5%	10.3%	20.1%	7.1%	22.1%	9.3%
Wood Waste	0.7%	1.1%	0.2%	0.4%	0.6%	0.4%	0.6%	0.7%
Textiles	1.8%	1.8%	5.8%	4.0%	4.7%	4.4%	3.9%	3.3%
Diapers	3.2%	1.9%	3.6%	1.5%	5.8%	2.1%	4.2%	1.9%
Other Organics	4.5%	2.2%	2.6%	2.0%	1.7%	1.3%	3.0%	1.9%
ORGANIC TOTALS	32.6%	17.5%	36.8%	18.1%	32.9%	15.3%	33.8%	17.0%
Fines	1.5%	0.8%	2.1%	1.8%	3.3%	1.2%	2.3%	1.2%
Other Inorganics	0.3%	0.1%	1.1%	0.4%	1.2%	0.6%	0.8%	0.3%
INORGANIC TOTALS	1.8%	0.9%	3.2%	2.2%	4.4%	1.8%	3.1%	1.6%
OTHER WASTE	1.0%	0.2%	0.2%	0.1%	0.7%	0.6%	0.7%	0.2%
SORT TOTALS	100%	100%	100%	100%	100%	100%	100%	100%

TABLE 17-8



Rolla Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	2,307,693
Total Sample Weight (lbs)	6588.7
Significance Test Results	.000
Number of Samples Collected	33
Mean Sample (lbs) and Confidence Interval (95%)	198.3 (+/-) 11.60

Rolla "Other Waste" Summary			
Over-the-counter Medication (OTC)	3	Beauty/Hygiene Aerosol Products	2
Prescription Medication (Rx)	13	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	9	Gardening/Yard Care Products	0
Household Cleaning Products	5	Pet Groom Products	0
Sharps/Blades	3	Disposable Razors	23
Syringes	40	Alkaline Batteries	37
Hardware/Shop Products	3	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	2		
Miscellaneous items: 2 containers of tar/asphalt, 1 container of bubble solution, 1/2 bag of water softener.			
Total Weight (lb): 44.95 Total Volume (cubic ft.): 2.7			



## Chapter 18: Osage Beach

### COMMUNITY PROFILE

The City of Osage Beach is located in Camden County in Central Missouri. It is part of the Lake of the Ozarks Solid Waste Management District (District T). Osage Beach is a popular tourist town due to its location on the Lake of the Ozarks and its large factory outlet shopping facilities. Modern Sanitation Transfer Station is located a few miles south of Osage Beach and receives waste from Camden and its surrounding counties. Osage Beach is 159 miles southwest of St. Louis, 92 miles northeast of Springfield, and 155 miles southeast of Kansas City.

#### Demographics:

	Osage Beach	Camden County
Area (sq. miles)	8.61	655.12
Population (1990)	2,609	27,495
Density (per sq. mile)	303.03	41.97
Pop. Change since 1980	32.4%	37.4%
Number of households	1,096	11,346
Persons per household	2.30	2.40
High school graduates	30.5%	38.7%
Median Family Income	\$31,875	\$25,363
Percent below poverty level	10.8%	12.6%



### **Solid Waste Collection**

Solid waste collection is open to private haulers, although Modern Sanitation has approximately 80%-90% of the Lake of the Ozark area business. There are no territories, and no curbside recycling is offered in the Lake area.

### **Solid Waste Disposal**

District T has two solid waste transfer stations: one in Osage Beach owned by Modern Sanitation and one in Eldridge owned by Waste Management. Modern Sanitation delivers its waste to a landfill in Jefferson City owned by Laidlaw. The transfer station accepts waste from Camden and the surrounding counties (Miller, Hickory, and the Lake areas). The transfer station receives approximately 20,000 tons of waste per year and the current gate tipping fee is \$44.00 per ton.

### **Waste Reduction and Recycling Programs**

There is one major drop-off facility in District T. It is located in Camdenton and is owned by Waste Management. The facility accepts tin and aluminum cans, PET plastic, HDPE plastic, and glass. There are also small facilities in the area that accept some recyclables. Modern Sanitation does accept cardboard at the transfer station.

### **Modern Sanitation Results**

Information about sample size and composition are listed in tables 18-1 to 18-8.

**All weights are listed in pounds and all volumes are in cubic feet.**

## **SORT #1**

### **Sort Conditions**

The first sort was conducted February 24-25, 1997. A site adjacent to the tipping area was selected as the sort location. The weather was mild and sunny. Traffic was very slow making it difficult to collect the maximum number of samples.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	307,692
Total Sample Weight (lbs)	1905.2
Significance Test Results	.000
Number of Samples Collected	10

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	3	Beauty/Hygiene Aerosol Products	0
Prescription Medication (Rx)	1	Household Cleaning Aerosol Products	2
Beauty/Hygiene Products	4	Gardening/Yard Care Products	0
Household Cleaning Products	0	Pet Groom Products	0
Sharps/Blades	0	Disposable Razors	5
Syringes	3	Alkaline Batteries	6
Hardware/Shop Products	0	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	4		
Miscellaneous items: None.			
Total Weight (lb): 8.2 Total Volume (cubic ft.): .4			

**TABLE 18-1**



**MODERN SANITATION (OSAGE BEACH)**  
**SORT # 1**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	198	48.8	100%	0%	Drop-off	Lake Ozark/Village of Four Seasons (residential)
2	171	43.5	100%	0%	Drop-off	Lake Ozark/Village of Four Seasons (residential)
3	172	45.6	100%	0%	Drop-off	Osage Beach (rural)
4	184	38.3	100%	0%	Drop-off	Osage Beach (residential)
5	160	38.9	100%	0%	Drop-off	Osage Beach (residential)
6	242.2	56	100%	0%	Drop-off	Osage Beach (residential)
7	266	42.4	100%	0%	Drop-off	Osage Beach (residential)
8	171	47.3	100%	0%	Drop-off	Osage Beach (residential)
9	159	45.4	100%	0%	Drop-off	Osage Beach (residential)
10	182	36	100%	0%	Drop-off	Osage Beach (residential)
<b>TOTALS</b>	<b>1905.2</b>	<b>442.2</b>				
<b>AVERAGE</b>	<b>190.52</b>	<b>44.2</b>	<b>100%</b>	<b>0%</b>		

TABLE 18-1



# MODERN SANITATION (OSAGE BEACH)

**SORT # 1**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	128.1	53.0	12.8	5.3	6.72%	11.97%
Newsprint	117.5	26.2	11.8	2.6	6.17%	5.92%
Magazines	68.2	7.8	6.8	0.8	3.58%	1.76%
High Grade	57.5	12.6	5.8	1.3	3.02%	2.85%
Mixed	291.4	80.0	29.1	8.0	15.29%	18.08%
<b>PAPER TOTALS</b>	<b>662.7</b>	<b>179.6</b>	<b>66.3</b>	<b>18.0</b>	<b>34.78%</b>	<b>40.58%</b>
Clear	88.3	8.7	8.8	0.9	4.63%	1.97%
Brown	36.5	3.8	3.7	0.4	1.92%	0.86%
Green	16.1	1.1	1.6	0.1	0.85%	0.25%
Other	16.5	1.5	1.7	0.2	0.87%	0.34%
<b>GLASS TOTALS</b>	<b>157.4</b>	<b>15.1</b>	<b>15.7</b>	<b>1.5</b>	<b>8.26%</b>	<b>3.41%</b>
Alum. Cans	38.0	13.0	3.8	1.3	1.99%	2.94%
Other Alum	18.2	4.2	1.8	0.4	0.96%	0.95%
Non ferrous	7.8	0.7	0.8	0.1	0.41%	0.16%
Food Cans	62.0	10.9	6.2	1.1	3.25%	2.46%
Ferrous	25.5	3.9	2.6	0.4	1.34%	0.88%
Oil Filters	4.2	0.2	0.4	0.0	0.22%	0.05%
<b>METAL TOTALS</b>	<b>155.7</b>	<b>32.9</b>	<b>15.6</b>	<b>3.3</b>	<b>8.17%</b>	<b>7.43%</b>
PET # 1	37.0	12.8	3.7	1.3	1.94%	2.89%
HDPE # 2	40.6	20.0	4.1	2.0	2.13%	4.52%
Film	71.5	44.5	7.2	4.5	3.75%	10.05%
Other Plastic	133.2	58.0	13.3	5.8	6.99%	13.10%
<b>PLASTIC TOTALS</b>	<b>282.3</b>	<b>135.3</b>	<b>28.2</b>	<b>13.5</b>	<b>14.82%</b>	<b>30.57%</b>
Food Waste	411.3	43.2	41.1	4.3	21.59%	9.76%
Wood Waste	8.9	0.9	0.9	0.1	0.47%	0.20%
Textiles	59.2	11.9	5.9	1.2	3.11%	2.69%
Diapers	37.5	2.6	3.8	0.3	1.97%	0.59%
Other Organics	48.0	11.7	4.8	1.2	2.52%	2.64%
<b>ORGANIC TOTALS</b>	<b>564.9</b>	<b>70.3</b>	<b>56.5</b>	<b>7.0</b>	<b>29.65%</b>	<b>15.88%</b>
Fines	42.5	6.3	4.3	0.6	2.23%	1.42%
Other Inorganics	31.5	2.7	3.2	0.3	1.65%	0.61%
<b>INORGANIC TOTALS</b>	<b>74.0</b>	<b>9.0</b>	<b>7.4</b>	<b>0.9</b>	<b>3.88%</b>	<b>2.03%</b>
<b>OTHER WASTE</b>	<b>8.2</b>	<b>0.4</b>	<b>0.8</b>	<b>0.0</b>	<b>0.43%</b>	<b>0.09%</b>
<b>GRAND TOTAL</b>	<b>1905.2</b>	<b>442.6</b>	<b>190.5</b>	<b>44.3</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 18-2



## **SORT #2**

### **Sort Conditions**

The second sort was conducted May 19-20, 1997. The same location was used for sort activities as the previous sort. The weather was rainy and cool.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	307,692
<b>Total Sample Weight (lbs)</b>	2652.3
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	4	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	2	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	5	<b>Gardening/Yard Care Products</b>	1
<b>Household Cleaning Products</b>	1	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	3	<b>Disposable Razors</b>	4
<b>Syringes</b>	0	<b>Alkaline Batteries</b>	47
<b>Hardware/Shop Products</b>	2	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> 1 bottle of charcoal starter, 1 fire extinguisher.			
<b>Total Weight (lb): 23.0</b>			
<b>Total Volume (cubic ft.): 1.0</b>			

## MODERN SANITATION (OSAGE BEACH)

### SORT # 2

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	160.1	44.7	50%	50%	Drop-off	Osage Beach
2	228	72.7	0%	100%	Drop-off	Osage Beach
3	154.9	46	100%	0%	Drop-off	Osage Beach
4	292.6	60.4	100%	0%	Drop-off	Osage Beach
5	236.4	45.4	80%	20%	Drop-off	Osage Beach
6	282	52.6	50%	50%	Drop-off	Osage Beach
7	261.2	48	0%	100%	Drop-off	Osage Beach
8	169.2	48	0%	100%	Drop-off	Osage Beach
9	246.9	53.1	90%	10%	Drop-off	Osage Beach
10	199.6	32.3	0%	100%	Drop-off	Osage Beach
11	159.4	44.1	90%	10%	Drop-off	Osage Beach
12	261.8	48.3	90%	10%	Drop-off	Osage Beach
<b>TOTALS</b>	<b>2652.3</b>	<b>595.4</b>				
<b>AVERAGE</b>	<b>221.025</b>	<b>49.6</b>	<b>54%</b>	<b>46%</b>		

TABLE 18-3



**MODERN SANITATION (OSAGE BEACH)**

**SORT # 2**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	248.6	85.5	20.7	7.1	9.37%	14.36%
Newsprint	154.0	30.9	12.8	2.6	5.81%	5.19%
Magazines	88.9	10.2	7.4	0.9	3.35%	1.71%
High Grade	177.4	27.4	14.8	2.3	6.69%	4.60%
Mixed	297.7	77.3	24.8	6.4	11.22%	12.98%
<b>PAPER TOTALS</b>	<b>966.6</b>	<b>231.3</b>	<b>80.6</b>	<b>19.3</b>	<b>36.44%</b>	<b>38.85%</b>
Clear	122.0	9.0	10.2	0.8	4.60%	1.51%
Brown	88.4	7.0	7.4	0.6	3.33%	1.18%
Green	19.0	1.1	1.6	0.1	0.72%	0.18%
Other	7.5	0.9	0.6	0.1	0.28%	0.15%
<b>GLASS TOTALS</b>	<b>236.9</b>	<b>18.0</b>	<b>19.7</b>	<b>1.5</b>	<b>8.93%</b>	<b>3.02%</b>
Alum. Cans	55.3	28.8	4.6	2.4	2.08%	4.84%
Other Alum	14.8	4.6	1.2	0.4	0.56%	0.77%
Non ferrous	10.8	2.3	0.9	0.2	0.41%	0.39%
Food Cans	59.7	12.8	5.0	1.1	2.25%	2.15%
Ferrous	24.5	3.4	2.0	0.3	0.92%	0.57%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>165.1</b>	<b>51.9</b>	<b>13.8</b>	<b>4.3</b>	<b>6.22%</b>	<b>8.72%</b>
PET # 1	29.2	16.7	2.4	1.4	1.10%	2.80%
HDPE # 2	42.9	24.5	3.6	2.0	1.62%	4.11%
Film	80.3	55.3	6.7	4.6	3.03%	9.29%
Other Plastic	196.1	86.8	16.3	7.2	7.39%	14.58%
<b>PLASTIC TOTALS</b>	<b>348.5</b>	<b>183.3</b>	<b>29.0</b>	<b>15.3</b>	<b>13.14%</b>	<b>30.79%</b>
Food Waste	472.8	47.1	39.4	3.9	17.83%	7.91%
Wood Waste	28.0	3.9	2.3	0.3	1.06%	0.66%
Textiles	124.2	20.0	10.4	1.7	4.68%	3.36%
Diapers	111.7	10.8	9.3	0.9	4.21%	1.81%
Other Organics	105.2	18.0	8.8	1.5	3.97%	3.02%
<b>ORGANIC TOTALS</b>	<b>841.9</b>	<b>99.8</b>	<b>70.2</b>	<b>8.3</b>	<b>31.74%</b>	<b>16.76%</b>
Fines	54.7	8.1	4.6	0.7	2.06%	1.36%
Other Inorganics	15.6	2.0	1.3	0.2	0.59%	0.34%
<b>INORGANIC TOTALS</b>	<b>70.3</b>	<b>10.1</b>	<b>5.9</b>	<b>0.8</b>	<b>2.65%</b>	<b>1.70%</b>
<b>OTHER WASTE</b>	<b>23.0</b>	<b>1.0</b>	<b>1.9</b>	<b>0.1</b>	<b>0.87%</b>	<b>0.17%</b>
<b>GRAND TOTAL</b>	<b>2652.3</b>	<b>595.4</b>	<b>221.0</b>	<b>49.6</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 18-4



### **SORT #3**

#### **Sort Conditions**

The third sort was conducted September 25-27, 1997. The same location was used for sort activities as the previous sort. The weather was sunny and mild. The maximum number of samples were not gathered due to slow traffic and vector problems (yellow jackets, hornets, etc.).

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	307,692
<b>Total Sample Weight (lbs)</b>	2239.8
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	10

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	1	<b>Beauty/Hygiene Aerosol Products</b>	1
<b>Prescription Medication (Rx)</b>	0	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	12	<b>Gardening/Yard Care Products</b>	1
<b>Household Cleaning Products</b>	0	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	8
<b>Syringes</b>	19	<b>Alkaline Batteries</b>	9
<b>Hardware/Shop Products</b>	9	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	1		
<b>Miscellaneous items:</b> 1 bottle of leather dye, 2 butane lighters.			
<b>Total Weight (lb): 12.5</b>			
<b>Total Volume (cubic ft.): 1.0</b>			



## MODERN SANITATION (OSAGE BEACH)

### SORT # 3

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	227.3	47.8	50%	50%	None	Musgrove, Bridal Cave
2	160	33.4	50%	50%	None	Laurie
3	239.2	47.6	100%	0%	None	Horseshoe Bend Lake (condos)
4	209.3	45.2	100%	0%	None	Horseshoe Bend Lake (condos)
5	185.5	36.3	85%	15%	None	Hermitage, Urbina
6	249.8	53.6	85%	15%	None	Hermitage, Urbina
7	259.6	53.4	80%	20%	Drop-off	Iberia (rural and lake area)
8	189.6	45.4	80%	20%	Drop-off	Iberia (rural and lake area)
9	203	53	100%	0%	None	Four Seasons (lake area)
10	316.8	63.4	50%	50%	Drop-off	Lake Ozark, Osage Beach
<b>TOTALS</b>	<b>2239.8</b>	<b>479.1</b>				
<b>AVERAGE</b>	<b>223.98</b>	<b>47.9</b>	<b>78%</b>	<b>22%</b>		

TABLE 18-5



**MODERN SANITATION (OSAGE BEACH)****SORT # 3**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	173.0	57.5	17.3	5.7	7.72%	11.99%
Newsprint	186.4	27.8	18.6	2.8	8.32%	5.80%
Magazines	81.1	5.2	8.1	0.5	3.62%	1.08%
High Grade	63.9	18.9	6.4	1.9	2.85%	3.95%
Mixed	243.0	66.9	24.3	6.7	10.85%	13.95%
<b>PAPER TOTALS</b>	<b>747.4</b>	<b>176.2</b>	<b>74.7</b>	<b>17.6</b>	<b>33.37%</b>	<b>36.77%</b>
Clear	102.3	7.1	10.2	0.7	4.57%	1.48%
Brown	31.8	2.4	3.2	0.2	1.42%	0.50%
Green	29.9	2.1	3.0	0.2	1.33%	0.44%
Other	9.8	0.9	1.0	0.1	0.44%	0.19%
<b>GLASS TOTALS</b>	<b>173.6</b>	<b>12.5</b>	<b>17.4</b>	<b>1.3</b>	<b>7.75%</b>	<b>2.61%</b>
Alum. Cans	34.5	18.7	3.4	1.9	1.54%	3.90%
Other Alum	10.8	3.7	1.1	0.4	0.48%	0.77%
Non ferrous	0.8	0.2	0.1	0.0	0.04%	0.04%
Food Cans	70.6	15.6	7.1	1.6	3.15%	3.26%
Ferrous	19.9	3.0	2.0	0.3	0.89%	0.63%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>136.5</b>	<b>41.2</b>	<b>13.7</b>	<b>4.1</b>	<b>6.09%</b>	<b>8.60%</b>
PET # 1	36.8	22.5	3.7	2.3	1.64%	4.70%
HDPE # 2	47.0	32.6	4.7	3.3	2.10%	6.81%
Film	82.3	47.5	8.2	4.8	3.67%	9.92%
Other Plastic	120.1	61.5	12.0	6.2	5.36%	12.84%
<b>PLASTIC TOTALS</b>	<b>286.1</b>	<b>164.1</b>	<b>28.6</b>	<b>16.4</b>	<b>12.77%</b>	<b>34.26%</b>
Food Waste	507.6	35.6	50.8	3.6	22.66%	7.43%
Wood Waste	16.5	1.5	1.6	0.2	0.73%	0.31%
Textiles	52.6	13.9	5.3	1.4	2.35%	2.90%
Diapers	101.8	11.8	10.2	1.2	4.54%	2.46%
Other Organics	78.1	9.8	7.8	1.0	3.49%	2.05%
<b>ORGANIC TOTALS</b>	<b>756.4</b>	<b>72.6</b>	<b>75.6</b>	<b>7.3</b>	<b>33.77%</b>	<b>15.15%</b>
Fines	112.5	10.0	11.2	1.0	5.02%	2.09%
Other Inorganics	14.9	1.5	1.5	0.2	0.66%	0.31%
<b>INORGANIC TOTALS</b>	<b>127.3</b>	<b>11.5</b>	<b>12.7</b>	<b>1.2</b>	<b>5.68%</b>	<b>2.40%</b>
<b>OTHER WASTE</b>	<b>12.5</b>	<b>1.0</b>	<b>1.3</b>	<b>0.1</b>	<b>0.56%</b>	<b>0.21%</b>
<b>GRAND TOTAL</b>	<b>2239.8</b>	<b>479.1</b>	<b>224.0</b>	<b>47.9</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 18-6



## **SORT SUMMARY**

### **Seasonal variations**

- Aluminum cans and glass totals were higher during the second sort, probably due to increased tourist traffic for the lake during the summer.
- Fast food wrappings and containers made up a good portion of mixed paper totals.
- Food waste increased during the second sort due to more “picnic” types of food (watermelon rinds, corn shucks, etc.).

### **Sort results**

- Chart 18-1 graphically compares the three seasonal sort results and shows the average waste composition, by major category, for Osage Beach.
- The sample data for all Osage Beach waste sorts are listed on Table 18-7.
- The sort results for Osage Beach are listed on Table 18-8.
- The summary of statistical relevance for the Osage Beach sorts is located on page 292.
- The total for all “other wastes” found during the Osage Beach sorts is on page 292.

**All weights are in pounds and volumes are listed in cubic feet.**

Comparisons of the Osage Beach’s waste stream to previous studies and other communities can be found in Chapter 24.



## OSAGE BEACH RESULTS BY WEIGHT

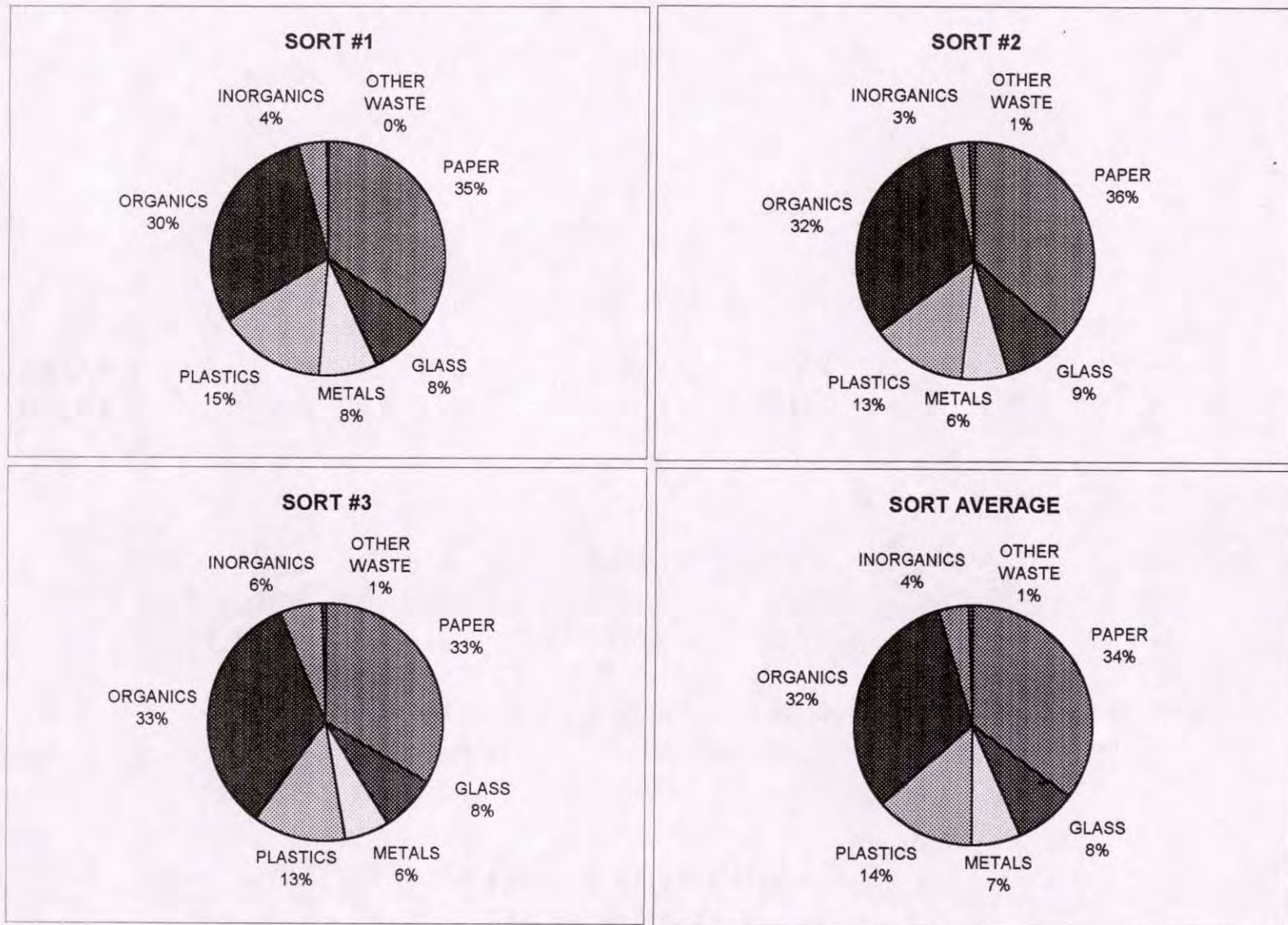


CHART 18-1



# **OSAGE BEACH SAMPLE SUMMARY**

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	2/24-2/25	10	2239.8	479.1	78%	22%
2	5/19-5/20	12	2652.3	595.4	54%	46%
3	9/25-9/27	10	1905.2	442.2	100%	0%
<b>TOTALS</b>		<b>32.0</b>	<b>6797.3</b>	<b>1516.7</b>		
<b>AVERAGE</b>		<b>10.7</b>	<b>2265.8</b>	<b>505.6</b>	<b>77%</b>	<b>23%</b>

TABLE 18-7



CATEGORY	OSAGE BEACH						SUMMARY	
	SORT # 1		SORT # 2		SORT # 3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	6.7%	12.0%	9.4%	14.4%	7.7%	12.0%	8.1%	12.9%
Newsprint	6.2%	5.9%	5.8%	5.2%	8.3%	5.8%	6.7%	5.6%
Magazines	3.6%	1.8%	3.4%	1.7%	3.6%	1.1%	3.5%	1.5%
High Grade	3.0%	2.8%	6.7%	4.6%	2.9%	3.9%	4.4%	3.9%
Mixed	15.3%	18.1%	11.2%	13.0%	10.8%	14.0%	12.2%	14.8%
<b>PAPER TOTALS</b>	<b>34.8%</b>	<b>40.6%</b>	<b>36.4%</b>	<b>38.8%</b>	<b>33.4%</b>	<b>36.8%</b>	<b>35.0%</b>	<b>38.7%</b>
Clear	4.6%	2.0%	4.6%	1.5%	4.6%	1.5%	4.6%	1.6%
Brown	1.9%	0.9%	3.3%	1.2%	1.4%	0.5%	2.3%	0.9%
Green	0.8%	0.2%	0.7%	0.2%	1.3%	0.4%	1.0%	0.3%
Other	0.9%	0.3%	0.3%	0.2%	0.4%	0.2%	0.5%	0.2%
<b>GLASS TOTALS</b>	<b>8.3%</b>	<b>3.4%</b>	<b>8.9%</b>	<b>3.0%</b>	<b>7.8%</b>	<b>2.6%</b>	<b>8.4%</b>	<b>3.0%</b>
Alum. Cans	2.0%	2.9%	2.1%	4.8%	1.5%	3.9%	1.9%	4.0%
Other Alum	1.0%	0.9%	0.6%	0.8%	0.5%	0.8%	0.6%	0.8%
Non ferrous	0.4%	0.2%	0.4%	0.4%	0.0%	0.0%	0.3%	0.2%
Food Cans	3.3%	2.5%	2.3%	2.1%	3.2%	3.3%	2.8%	2.6%
Ferrous	1.3%	0.9%	0.9%	0.6%	0.9%	0.6%	1.0%	0.7%
Oil Filters	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
<b>METAL TOTALS</b>	<b>8.2%</b>	<b>7.4%</b>	<b>6.2%</b>	<b>8.7%</b>	<b>6.1%</b>	<b>8.6%</b>	<b>6.7%</b>	<b>8.3%</b>
PET # 1	1.9%	2.9%	1.1%	2.8%	1.6%	4.7%	1.5%	3.4%
HDPE # 2	2.1%	4.5%	1.6%	4.1%	2.1%	6.8%	1.9%	5.1%
Film	3.8%	10.1%	3.0%	9.3%	3.7%	9.9%	3.4%	9.7%
Other Plastic	7.0%	13.1%	7.4%	14.6%	5.4%	12.8%	6.6%	13.6%
<b>PLASTIC TOTALS</b>	<b>14.8%</b>	<b>30.6%</b>	<b>13.1%</b>	<b>30.8%</b>	<b>12.8%</b>	<b>34.3%</b>	<b>13.5%</b>	<b>31.8%</b>
Food Waste	21.6%	9.8%	17.8%	7.9%	22.7%	7.4%	20.5%	8.3%
Wood Waste	0.5%	0.2%	1.1%	0.7%	0.7%	0.3%	0.8%	0.4%
Textiles	3.1%	2.7%	4.7%	3.4%	2.3%	2.9%	3.5%	3.0%
Diapers	2.0%	0.6%	4.2%	1.8%	4.5%	2.5%	3.7%	1.7%
Other Organics	2.5%	2.6%	4.0%	3.0%	3.5%	2.0%	3.4%	2.6%
<b>ORGANIC TOTALS</b>	<b>29.7%</b>	<b>15.9%</b>	<b>31.7%</b>	<b>16.8%</b>	<b>33.8%</b>	<b>15.2%</b>	<b>31.8%</b>	<b>16.0%</b>
Fines	2.2%	1.4%	2.1%	1.4%	5.0%	2.1%	3.1%	1.6%
Other Inorganics	1.7%	0.6%	0.6%	0.3%	0.7%	0.3%	0.9%	0.4%
<b>INORGANIC TOTALS</b>	<b>3.9%</b>	<b>2.0%</b>	<b>2.7%</b>	<b>1.7%</b>	<b>5.7%</b>	<b>2.4%</b>	<b>4.0%</b>	<b>2.0%</b>
<b>OTHER WASTE</b>	<b>0.4%</b>	<b>0.1%</b>	<b>0.9%</b>	<b>0.2%</b>	<b>0.6%</b>	<b>0.4%</b>	<b>0.6%</b>	<b>0.2%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 18-8



Osage Beach Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	923,076
Total Sample Weight (lbs)	6797.8
Significance Test Results	.000
Number of Samples Collected	32
Mean Sample (lbs) and Confidence Interval (95%)	211.07 (+/-) 16.45

Osage Beach "Other Waste" Summary			
Over-the-counter Medication (OTC)	8	Beauty/Hygiene Aerosol Products	1
Prescription Medication (Rx)	3	Household Cleaning Aerosol Products	2
Beauty/Hygiene Products	21	Gardening/Yard Care Products	2
Household Cleaning Products	1	Pet Groom Products	0
Sharps/Blades	3	Disposable Razors	17
Syringes	22	Alkaline Batteries	62
Hardware/Shop Products	11	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	5		
Miscellaneous items: 1 bottle of charcoal starter, 1 fire extinguisher, 1 bottle of leather dye, 2 butane lighters.			
Total Weight (lb): 43.7 Total Volume (cubic ft.): 2.4			



## Chapter 19: Sedalia

### COMMUNITY PROFILE

The City of Sedalia is located in Pettis County and is part of the West Central Missouri Solid Waste Management District (District F). Sedalia is the county seat and is the site for the state fairgrounds. It is a business and manufacturing center for its area. Central Missouri Landfill is located west of town on Highway 50. Sedalia is located 186 miles west of St. Louis, 118 miles north of Springfield, and 87 miles east of Kansas City.

#### Demographics:

	<b>Sedalia</b>	<b>Pettis County</b>
Area (sq. miles)	11.23	684.91
Population (1990)	19,800	35,437
Density (per sq. mile)	1762.57	51.74
Pop. Change since 1980	-5.4%	37.4%
Number of households	8,478	14,122
Persons per household	2.30	2.48
High school graduates	34.7%	38.7%
Median Family Income	\$25,419	\$27,156
Percent below poverty level	15.0%	13.8%



### **Solid Waste Collection**

The City of Sedalia operates its own fleet of collection vehicles. Commercial routes and routes outside the city limits are open to independent haulers. There are no zones or territories established for solid waste collection. No curbside recycling is currently offered.

### **Solid Waste Disposal**

Central Missouri Landfill accepts waste from Pettis and the surrounding counties (Saline, Cooper, Moniteau, etc.). The landfill receives approximately 102,000 tons of waste per year and the current gate tipping fee is \$25.00 per ton.

### **Waste Reduction and Recycling Programs**

There are three drop-off centers located in Sedalia; two accept plastics and cardboard and one accepts aluminum and steel cans. Central Missouri Landfill accepts special waste, bulky items, yard waste, and household hazardous waste for a fee. District F sponsors several educational programs including Recycling Days, held in November.

### **Central Missouri Landfill Results**

Information about sample size and composition are listed in tables 19-1 to 19-8.

**All weights are listed in pounds and all volumes are in cubic feet.**

## **SORT #1**

### **Sort Conditions**

The first sort was conducted March 6-7, 1997. A location east of the tipping area was chosen as the site location. The weather was cool and sunny. The maximum number of samples were not collected due to equipment failures.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	310,031
<b>Total Sample Weight (lbs)</b>	1299.8
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	8

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	0	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	0	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	0	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	0	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	1
<b>Syringes</b>	4	<b>Alkaline Batteries</b>	10
<b>Hardware/Shop Products</b>	0	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> 1 full bingo ink blotter.			
<b>Total Weight (lb): 8.0</b>			
<b>Total Volume (cubic ft.): 0.2</b>			

**TABLE 19-1**



**CENTRAL MISSOURI LANDFILL (SEDALIA)**  
**SORT # 1**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	182.6	39.8	99%	1%	Drop-off	Warrensburg (trailer park)
2	189.9	37.1	0%	100%	Drop-off	Sedalia (in-town)
3	183.6	37.5	50%	50%	Drop-off	Warrensburg
4	153.9	33.7	75%	25%	None	Hughesville (rural) and Sedalia (commercial)
5	127.7	27.4	50%	50%	None	California (in-town)
6	160.5	37.2	100%	0%	Drop-off	Sedalia (city residential)
7	155.1	41.7	100%	0%	Drop-off	Sedalia (trailer court)
8	146.3	34.3	90%	10%	None	Houstonia (rural/residential/commercial)
<b>TOTALS</b>	<b>1299.6</b>	<b>288.9</b>				
<b>AVERAGE</b>	<b>162.45</b>	<b>36.1</b>	<b>70%</b>	<b>30%</b>		

TABLE 19-1



**CENTRAL MISSOURI LANDFILL (SEDALIA)****SORT # 1**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	109.8	41.8	13.7	5.2	8.45%	14.47%
Newsprint	81.9	14.7	10.2	1.8	6.30%	5.09%
Magazines	48.5	4.5	6.1	0.6	3.73%	1.56%
High Grade	69.1	12.6	8.6	1.6	5.32%	4.36%
Mixed	206.6	43.3	25.8	5.4	15.89%	14.99%
<b>PAPER TOTALS</b>	<b>515.9</b>	<b>116.9</b>	<b>64.5</b>	<b>14.6</b>	<b>39.69%</b>	<b>40.46%</b>
Clear	32.2	3.3	4.0	0.4	2.48%	1.14%
Brown	20.4	1.8	2.6	0.2	1.57%	0.62%
Green	9.7	1.0	1.2	0.1	0.75%	0.35%
Other	2.2	0.2	0.3	0.0	0.17%	0.07%
<b>GLASS TOTALS</b>	<b>64.5</b>	<b>6.3</b>	<b>8.1</b>	<b>0.8</b>	<b>4.96%</b>	<b>2.18%</b>
Alum. Cans	24.3	7.7	3.0	1.0	1.87%	2.67%
Other Alum	9.8	2.3	1.2	0.3	0.75%	0.80%
Non ferrous	0.0	0.0	0.0	0.0	0.00%	0.00%
Food Cans	52.6	11.2	6.6	1.4	4.05%	3.88%
Ferrous	9.8	0.8	1.2	0.1	0.75%	0.28%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>96.5</b>	<b>22.0</b>	<b>12.1</b>	<b>2.8</b>	<b>7.42%</b>	<b>7.62%</b>
PET # 1	26.6	14.0	3.3	1.8	2.05%	4.85%
HDPE # 2	28.3	15.5	3.5	1.9	2.18%	5.37%
Film	34.2	22.5	4.3	2.8	2.63%	7.79%
Other Plastic	122.0	47.0	15.3	5.9	9.39%	16.27%
<b>PLASTIC TOTALS</b>	<b>211.1</b>	<b>99.0</b>	<b>26.4</b>	<b>12.4</b>	<b>16.24%</b>	<b>34.27%</b>
Food Waste	232.1	21.5	29.0	2.7	17.86%	7.44%
Wood Waste	4.4	1.7	0.6	0.2	0.34%	0.59%
Textiles	39.4	8.1	4.9	1.0	3.03%	2.80%
Diapers	67.2	5.8	8.4	0.7	5.17%	2.01%
Other Organics	17.1	2.5	2.1	0.3	1.32%	0.87%
<b>ORGANIC TOTALS</b>	<b>360.2</b>	<b>39.6</b>	<b>45.0</b>	<b>5.0</b>	<b>27.71%</b>	<b>13.71%</b>
Fines	43.6	4.6	5.5	0.6	3.35%	1.59%
Other Inorganics	7.0	0.3	0.9	0.0	0.54%	0.10%
<b>INORGANIC TOTALS</b>	<b>50.6</b>	<b>4.9</b>	<b>6.3</b>	<b>0.6</b>	<b>3.89%</b>	<b>1.70%</b>
<b>OTHER WASTE</b>	<b>1.0</b>	<b>0.2</b>	<b>0.1</b>	<b>0.03</b>	<b>0.08%</b>	<b>0.07%</b>
<b>GRAND TOTAL</b>	<b>1299.8</b>	<b>288.9</b>	<b>162.5</b>	<b>36.1</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 19-2



## **SORT #2**

### **Sort Conditions**

The second sort was conducted May 21-22, 1997. The same location was used for sort activities as the previous sort. The weather was sunny, windy, and mild.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	310,031
<b>Total Sample Weight (lbs)</b>	2725.1
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	2	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	8	<b>Household Cleaning Aerosol Products</b>	1
<b>Beauty/Hygiene Products</b>	4	<b>Gardening/Yard Care Products</b>	2
<b>Household Cleaning Products</b>	1	<b>Pet Groom Products</b>	2
<b>Sharps/Blades</b>	18	<b>Disposable Razors</b>	1
<b>Syringes</b>	2	<b>Alkaline Batteries</b>	12
<b>Hardware/Shop Products</b>	0	<b>Automobile Maintenance/Cleaning Products</b>	1
<b>Aerosol Cans</b>	6		
<b>Miscellaneous items:</b> 1 IV with saline solution (no needle), 1 container of bubble humidifier, 1 package of instant hot compress, 1 marker, 1 set of water colors, 1 container of acrylic enamel.			
<b>Total Weight (1b): 16.0</b>			
<b>Total Volume (cubic ft.): 1.0</b>			

# CENTRAL MISSOURI LANDFILL (SEDALIA)

## SORT # 2

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	332.3	54.2	50%	50%	None	California
2	187.6	47.7	0%	100%	Drop-off	Sedalia
3	250.2	74.8	0%	100%	Drop-off	Sedalia
4	174.9	43.1	70%	30%	None	Green Ridge (rural)
5	228.4	47.2	70%	30%	None	Green Ridge (rural)
6	199.4	57.8	50%	50%	Drop-off	Sedalia
7	210.2	52.2	75%	25%	Drop-off	Sedalia
8	280.5	51.3	50%	50%	Drop-off	Sedalia
9	187.3	45.6	0%	100%	Drop-off	Sedalia
10	248.7	45.5	90%	10%	Curbside/Drop-off	Marshall
11	243.9	60.9	100%	0%	None	Green Ridge
12	180.9	38.9	100%	0%	Drop-off	Sedalia
<b>TOTALS</b>	<b>2725.1</b>	<b>619</b>				
<b>AVERAGE</b>	<b>227.0917</b>	<b>51.6</b>	<b>55%</b>	<b>45%</b>		

TABLE 19-3



**CENTRAL MISSOURI LANDFILL (SEDALIA)****SORT # 2**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	256.9	78.9	21.4	6.6	9.43%	12.75%
Newsprint	144.1	27.1	12.0	2.3	5.29%	4.38%
Magazines	94.8	11.4	7.9	1.0	3.48%	1.84%
High Grade	119.5	35.1	10.0	2.9	4.39%	5.67%
Mixed	431.4	121.2	36.0	10.1	15.83%	19.58%
<b>PAPER TOTALS</b>	<b>1046.7</b>	<b>273.7</b>	<b>87.2</b>	<b>22.8</b>	<b>38.41%</b>	<b>44.22%</b>
Clear	81.5	5.1	6.8	0.4	2.99%	0.82%
Brown	26.2	2.7	2.2	0.2	0.96%	0.44%
Green	2.0	0.3	0.2	0.0	0.07%	0.05%
Other	5.1	0.7	0.4	0.1	0.19%	0.11%
<b>GLASS TOTALS</b>	<b>114.8</b>	<b>8.8</b>	<b>9.6</b>	<b>0.7</b>	<b>4.21%</b>	<b>1.42%</b>
Alum. Cans	32.3	14.0	2.7	1.2	1.19%	2.26%
Other Alum	13.2	3.7	1.1	0.3	0.48%	0.60%
Non ferrous	0.9	0.6	0.1	0.1	0.03%	0.10%
Food Cans	68.7	14.2	5.7	1.2	2.52%	2.29%
Ferrous	17.3	1.5	1.4	0.1	0.63%	0.24%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>132.4</b>	<b>34.0</b>	<b>11.0</b>	<b>2.8</b>	<b>4.86%</b>	<b>5.49%</b>
PET # 1	32.8	16.8	2.7	1.4	1.20%	2.71%
HDPE # 2	41.9	24.8	3.5	2.1	1.54%	4.01%
Film	142.0	47.0	11.8	3.9	5.21%	7.59%
Other Plastic	225.6	92.4	18.8	7.7	8.28%	14.93%
<b>PLASTIC TOTALS</b>	<b>442.3</b>	<b>181.0</b>	<b>36.9</b>	<b>15.1</b>	<b>16.23%</b>	<b>29.24%</b>
Food Waste	516.2	53.1	43.0	4.4	18.94%	8.58%
Wood Waste	10.4	3.1	0.9	0.3	0.38%	0.50%
Textiles	79.1	14.9	6.6	1.2	2.90%	2.41%
Diapers	105.6	13.7	8.8	1.1	3.87%	2.21%
Other Organics	146.7	17.2	12.2	1.4	5.38%	2.78%
<b>ORGANIC TOTALS</b>	<b>858.0</b>	<b>102.0</b>	<b>71.5</b>	<b>8.5</b>	<b>31.48%</b>	<b>16.48%</b>
Fines	50.6	9.8	4.2	0.8	1.86%	1.58%
Other Inorganics	64.4	8.7	5.4	0.7	2.36%	1.41%
<b>INORGANIC TOTALS</b>	<b>115.0</b>	<b>18.5</b>	<b>9.6</b>	<b>1.5</b>	<b>4.22%</b>	<b>2.99%</b>
<b>OTHER WASTE</b>	<b>16.0</b>	<b>1.0</b>	<b>1.3</b>	<b>0.1</b>	<b>0.59%</b>	<b>0.16%</b>
<b>GRAND TOTAL</b>	<b>2725.1</b>	<b>619.0</b>	<b>227.1</b>	<b>51.6</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 19-4



### **SORT #3**

#### **Sort Conditions**

The third sort was conducted September 22-24, 1997. The same location was used for sort activities as the previous sort. The weather rainy and cold. The maximum number of samples were not gathered due unfavorable weather conditions.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	310,031
<b>Total Sample Weight (lbs)</b>	2167.6
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	9

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	3	<b>Beauty/Hygiene Aerosol Products</b>	2
<b>Prescription Medication (Rx)</b>	0	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	10	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	2	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	1	<b>Disposable Razors</b>	9
<b>Syringes</b>	0	<b>Alkaline Batteries</b>	8
<b>Hardware/Shop Products</b>	1	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	2		
<b>Miscellaneous items:</b> 1 bottle of hair permanent solution, 1 package of fire crackers.			
<b>Total Weight (1b): 6.25</b> <b>Total Volume (cubic ft.): 0.3</b>			



**CENTRAL MISSOURI LANDFILL (SEDALIA)**  
**SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	203.6	45.3	90%	10%	Drop-off	Sedalia
2	251.1	43.2	10%	90%	None	Four Seasons Village
3	270.2	42.8	90%	10%	None	Georgetown
4	273.7	45.8	90%	10%	Drop-off	Sedalia
5	236.9	35.7	90%	10%	Drop-off	California
6	212.7	37.6	100%	0%	Drop-off	Sedalia
7	232.8	51.9	100%	0%	None	Dover
8	244.1	42.4	100%	0%	None	Dover
9	242.4	43.4	90%	10%	Lake of the Ozarks	Dover
<b>TOTALS</b>	<b>2161.4</b>	<b>388.1</b>				
<b>AVERAGE</b>	<b>240.1556</b>	<b>43.1</b>	<b>84%</b>	<b>16%</b>		

TABLE 19-5

**CENTRAL MISSOURI LANDFILL (SEDALIA)****SORT # 3**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	125.1	39.7	13.9	4.4	5.77%	10.22%
Newsprint	147.4	20.7	16.4	2.3	6.80%	5.33%
Magazines	92.8	7.0	10.3	0.8	4.28%	1.80%
High Grade	65.5	11.3	7.3	1.3	3.02%	2.91%
Mixed	331.2	65.5	36.8	7.3	15.28%	16.87%
<b>PAPER TOTALS</b>	<b>762.0</b>	<b>144.2</b>	<b>84.7</b>	<b>16.0</b>	<b>35.15%</b>	<b>37.13%</b>
Clear	63.3	3.4	7.0	0.4	2.92%	0.88%
Brown	28.3	2.0	3.1	0.2	1.30%	0.52%
Green	9.0	0.8	1.0	0.1	0.41%	0.21%
Other	10.6	1.2	1.2	0.1	0.49%	0.31%
<b>GLASS TOTALS</b>	<b>111.0</b>	<b>7.4</b>	<b>12.3</b>	<b>0.8</b>	<b>5.12%</b>	<b>1.91%</b>
Alum. Cans	48.4	20.9	5.4	2.3	2.23%	5.38%
Other Alum	16.5	3.9	1.8	0.4	0.76%	1.00%
Non ferrous	1.0	0.1	0.1	0.0	0.05%	0.03%
Food Cans	64.8	12.1	7.2	1.3	2.99%	3.12%
Ferrous	26.8	3.6	3.0	0.4	1.24%	0.93%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>157.5</b>	<b>40.6</b>	<b>17.5</b>	<b>4.5</b>	<b>7.26%</b>	<b>10.46%</b>
PET # 1	28.8	14.8	3.2	1.6	1.33%	3.81%
HDPE # 2	53.5	26.4	5.9	2.9	2.47%	6.80%
Film	78.3	34.8	8.7	3.9	3.61%	8.95%
Other Plastic	110.3	42.5	12.3	4.7	5.09%	10.94%
<b>PLASTIC TOTALS</b>	<b>270.8</b>	<b>118.5</b>	<b>30.1</b>	<b>13.2</b>	<b>12.49%</b>	<b>30.50%</b>
Food Waste	518.0	37.5	57.6	4.2	23.90%	9.66%
Wood Waste	10.0	1.2	1.1	0.1	0.46%	0.31%
Textiles	78.1	13.3	8.7	1.5	3.60%	3.43%
Diapers	66.0	6.2	7.3	0.7	3.04%	1.60%
Other Organics	47.8	7.1	5.3	0.8	2.20%	1.83%
<b>ORGANIC TOTALS</b>	<b>719.8</b>	<b>65.3</b>	<b>80.0</b>	<b>7.3</b>	<b>33.21%</b>	<b>16.82%</b>
Fines	93.8	7.0	10.4	0.8	4.33%	1.80%
Other Inorganics	46.7	5.1	5.2	0.6	2.15%	1.31%
<b>INORGANIC TOTALS</b>	<b>140.5</b>	<b>12.1</b>	<b>15.6</b>	<b>1.3</b>	<b>6.48%</b>	<b>3.12%</b>
<b>OTHER WASTE</b>	<b>6.2</b>	<b>0.3</b>	<b>0.7</b>	<b>0.03</b>	<b>0.29%</b>	<b>0.07%</b>
<b>GRAND TOTAL</b>	<b>2167.6</b>	<b>388.3</b>	<b>240.8</b>	<b>43.1</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 19-6



## **SORT SUMMARY**

### **Seasonal variations**

- Food waste was higher in the third sort than in the first and second sort. Many routes on the third sort were fast food and commercial routes.
- The percentage for diapers was a little larger than the norm.
- Metal totals dropped in the second round (especially ferrous food cans). This could be due to people eating out more during the summer.

### **Sort results**

- Chart 19-1 graphically compares the three seasonal sort results and shows the average waste composition, by major category, for Sedalia.
- The sample data for all Sedalia waste sorts are listed on Table 19-7.
- The sort results for Sedalia are listed on Table 19-8.
- The summary of statistical relevance for the Sedalia sorts is located on page 308.
- The total for all “other wastes” found during the Sedalia sorts is on page 308.

**All weights are in pounds and volumes are listed in cubic feet.**

Comparisons of the Sedalia’s waste stream to previous studies and other communities can be found in Chapter 24.

## SEDALIA RESULTS BY WEIGHT

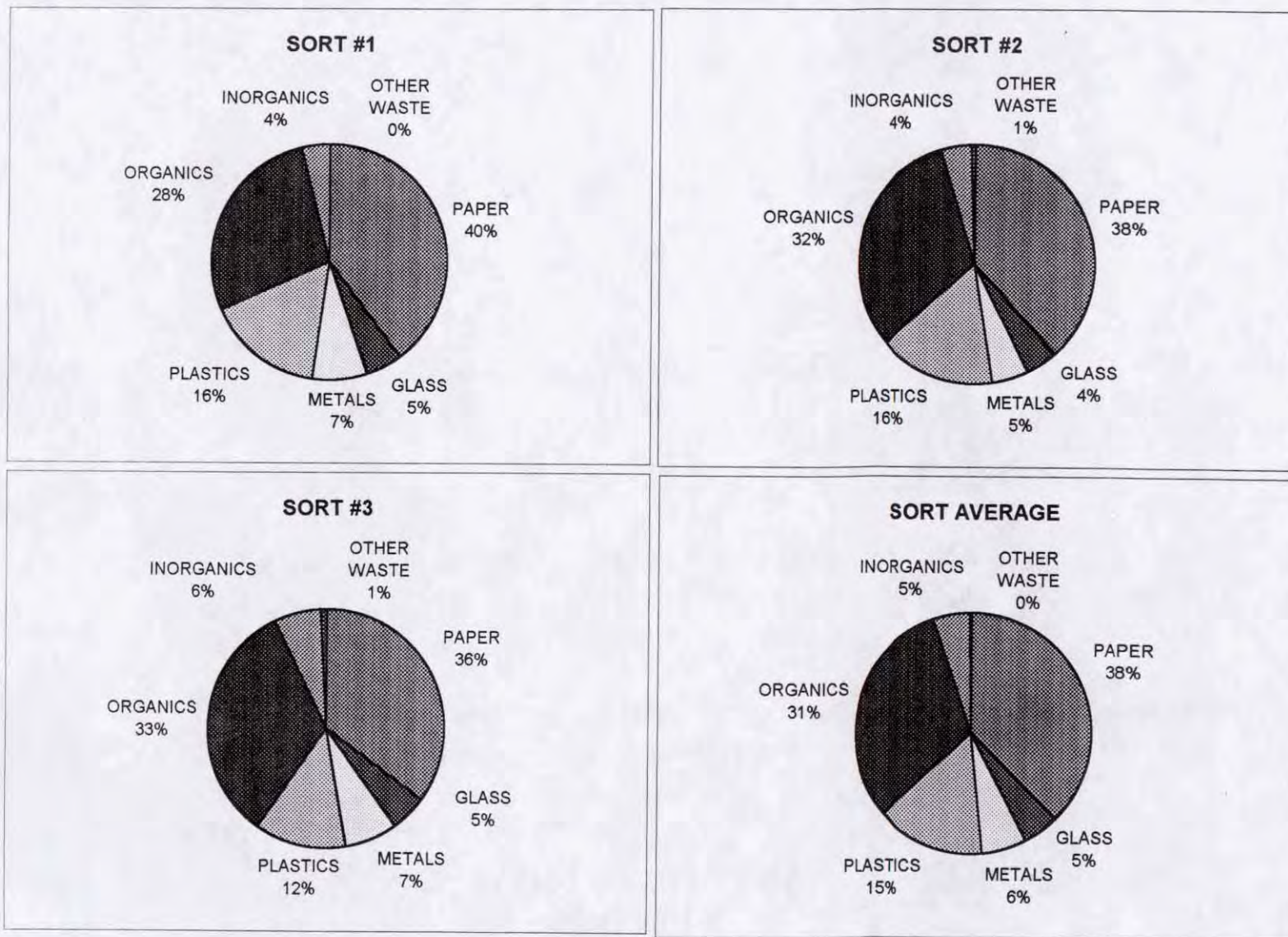


CHART 19-1



# **SEDALIA SAMPLE SUMMARY**

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	3/6-3/7	8	1299.6	288.9	70%	30%
2	5/21-5/22	12	2725.1	619.0	55%	45%
3	9/22-9/24	9	2161.4	388.1	84%	16%
TOTALS		29.0	6186.1	1296.0		
AVERAGE		9.7	2062.0	432.0	70%	30%

TABLE 19-7



CATEGORY	SEDALIA						SUMMARY	
	SORT # 1		SORT # 2		SORT #3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	8.4%	14.5%	9.4%	12.7%	5.8%	10.2%	7.9%	12.4%
Newsprint	6.3%	5.1%	5.3%	4.4%	6.8%	5.3%	6.0%	4.8%
Magazines	3.7%	1.6%	3.5%	1.8%	4.3%	1.8%	3.8%	1.8%
High Grade	5.3%	4.4%	4.4%	5.7%	3.0%	2.9%	4.1%	4.6%
Mixed	15.9%	15.0%	15.8%	19.6%	15.3%	16.9%	15.7%	17.7%
<b>PAPER TOTALS</b>	<b>39.7%</b>	<b>40.5%</b>	<b>38.4%</b>	<b>44.2%</b>	<b>35.2%</b>	<b>37.1%</b>	<b>37.5%</b>	<b>41.3%</b>
Clear	2.5%	1.1%	3.0%	0.8%	2.9%	0.9%	2.9%	0.9%
Brown	1.6%	0.6%	1.0%	0.4%	1.3%	0.5%	1.2%	0.5%
Green	0.7%	0.3%	0.1%	0.0%	0.4%	0.2%	0.3%	0.2%
Other	0.2%	0.1%	0.2%	0.1%	0.5%	0.3%	0.3%	0.2%
<b>GLASS TOTALS</b>	<b>5.0%</b>	<b>2.2%</b>	<b>4.2%</b>	<b>1.4%</b>	<b>5.1%</b>	<b>1.9%</b>	<b>4.7%</b>	<b>1.7%</b>
Alum. Cans	1.9%	2.7%	1.2%	2.3%	2.2%	5.4%	1.7%	3.3%
Other Alum	0.8%	0.8%	0.5%	0.6%	0.8%	1.0%	0.6%	0.8%
Non ferrous	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
Food Cans	4.0%	3.9%	2.5%	2.3%	3.0%	3.1%	3.0%	2.9%
Ferrous	0.8%	0.3%	0.6%	0.2%	1.2%	0.9%	0.9%	0.5%
Oil Filters	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>METAL TOTALS</b>	<b>7.4%</b>	<b>7.6%</b>	<b>4.9%</b>	<b>5.5%</b>	<b>7.3%</b>	<b>10.5%</b>	<b>6.2%</b>	<b>7.5%</b>
PET # 1	2.0%	4.8%	1.2%	2.7%	1.3%	3.8%	1.4%	3.5%
HDPE # 2	2.2%	5.4%	1.5%	4.0%	2.5%	6.8%	2.0%	5.1%
Film	2.6%	7.8%	5.2%	7.6%	3.6%	9.0%	4.1%	8.0%
Other Plastic	9.4%	16.3%	8.3%	14.9%	5.1%	10.9%	7.4%	14.0%
<b>PLASTIC TOTALS</b>	<b>16.2%</b>	<b>34.3%</b>	<b>16.2%</b>	<b>29.2%</b>	<b>12.5%</b>	<b>30.5%</b>	<b>14.9%</b>	<b>30.7%</b>
Food Waste	17.9%	7.4%	18.9%	8.6%	23.9%	9.7%	20.4%	8.6%
Wood Waste	0.3%	0.6%	0.4%	0.5%	0.5%	0.3%	0.4%	0.5%
Textiles	3.0%	2.8%	2.9%	2.4%	3.6%	3.4%	3.2%	2.8%
Diapers	5.2%	2.0%	3.9%	2.2%	3.0%	1.6%	3.9%	2.0%
Other Organics	1.3%	0.9%	5.4%	2.8%	2.2%	1.8%	3.4%	2.1%
<b>ORGANIC TOTALS</b>	<b>27.7%</b>	<b>13.7%</b>	<b>31.5%</b>	<b>16.5%</b>	<b>33.2%</b>	<b>16.8%</b>	<b>31.3%</b>	<b>16.0%</b>
Fines	3.4%	1.6%	1.9%	1.6%	4.3%	1.8%	3.0%	1.7%
Other Inorganics	0.5%	0.1%	2.4%	1.4%	2.2%	1.3%	1.9%	1.1%
<b>INORGANIC TOTALS</b>	<b>3.9%</b>	<b>1.7%</b>	<b>4.2%</b>	<b>3.0%</b>	<b>6.5%</b>	<b>3.1%</b>	<b>4.9%</b>	<b>2.7%</b>
<b>OTHER WASTE</b>	<b>0.1%</b>	<b>0.1%</b>	<b>0.6%</b>	<b>0.2%</b>	<b>0.9%</b>	<b>0.2%</b>	<b>0.4%</b>	<b>0.1%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 19-8



Sedalia Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	930,093
Total Sample Weight (lbs)	6192.5
Significance Test Results	.000
Number of Samples Collected	29
Mean Sample (lbs) and Confidence Interval (95%)	212.74 (+/-) 17.74

Sedalia "Other Waste" Summary			
Over-the-counter Medication (OTC)	5	Beauty/Hygiene Aerosol Products	2
Prescription Medication (Rx)	8	Household Cleaning Aerosol Products	1
Beauty/Hygiene Products	14	Gardening/Yard Care Products	2
Household Cleaning Products	3	Pet Groom Products	2
Sharps/Blades	23	Disposable Razors	11
Syringes	6	Alkaline Batteries	30
Hardware/Shop Products	1	Automobile Maintenance/Cleaning Products	1
Aerosol Cans	8		
<b>Miscellaneous items:</b> 1 full bingo ink blotter, 1 IV with saline solution (no needle) 1 container of bubble humidifier, 1 package of instant hot compress, 1 marker, 1 set of water colors, 1 container of acrylic enamel, 1 bottle of hair permanent solution, 1 package of firecrackers.			
<b>Total Weight (lb): 30.25</b> <b>Total Volume (cubic ft.): 1.5</b>			

## Chapter 20: St. Joseph

### COMMUNITY PROFILE

St. Joseph is the fourth largest city in Missouri. It is the county seat of Buchanan County and is a member of the Region D Solid Waste Management District in Northwest Missouri. St. Joseph is a large manufacturing and business center and is home to the Pony Express museum and Missouri Western State College. The City is located along Interstate 29 and is 307 miles west of St. Louis, 219 miles north of Springfield, and 55 miles north of Kansas City.

#### Demographics:

	<b>St. Joseph</b>	<b>Buchanan County</b>
Area (sq. miles)	43.36	409.69
Population (1990)	71,852	83,083
Density (per sq. mile)	1656.99	202.79
Pop. Change since 1980	-6.3%	-5.5%
Number of households	28,291	32,368
Persons per household	2.50	2.49
High school graduates	35.9%	36.7%
Median Family Income	\$27,749	\$28,476
Percent below poverty level	16.7%	15.6%



### **Solid Waste Collection**

Solid Waste is collected by private haulers. Trash collection is not mandatory in St. Joseph. There are approximately 10 private haulers currently servicing the St. Joseph area.

### **Solid Waste Disposal**

The City of St. Joseph owns and operates its own landfill, and it is the only landfill in District D. Most of the solid waste from St. Joseph and the surrounding areas is transported to this landfill. The City of St. Joseph Landfill receives approximately 104,522 tons of waste per year, and the tipping fee at the landfill is \$24.00 per ton.

### **Waste Reduction and Recycling Programs**

St. Joseph has one drop-off recycling facility that is open to the public four days a week. Approximately 996 tons of material per year are recycled through this facility (1996). Education about recycling is done through the city newspaper, and District D does some education through the schools. The District also sponsors many seasonal "pick-up" programs for their areas including household hazardous waste, textiles, and tires.

### **St. Joseph Sanitary Landfill Results**

Information about sample size and composition are listed in tables 20-1 to 20-8.

**All weights are listed in pounds and all volumes are in cubic feet.**

## **SORT #1**

### **Sort Conditions**

The first sort was conducted March 10-11, 1997. A site adjacent to the main unloading cell was selected for sorting activities. The weather was mild and sunny.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	1,598,369
<b>Total Sample Weight (lbs)</b>	2721.3
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	2	<b>Beauty/Hygiene Aerosol Products</b>	1
<b>Prescription Medication (Rx)</b>	1	<b>Household Cleaning Aerosol Products</b>	2
<b>Beauty/Hygiene Products</b>	5	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	0	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	25
<b>Syringes</b>	1	<b>Alkaline Batteries</b>	11
<b>Hardware/Shop Products</b>	0	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	4		
<b>Miscellaneous items:</b> 1 shotgun shell.			
<b>Total Weight (lb): 7.5</b>			
<b>Total Volume (cubic ft.): .5</b>			



**ST. JOSEPH SANITARY LANDFILL**  
**SORT # 1**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	249.1	47.5	100%	0%	Drop-off	St. Joseph (residential)
2	310	63.7	90%	10%	Drop-off	St. Joseph (residential)
3	190.3	51.5	100%	0%	Drop-off	St. Joseph (residential)
4	206.2	55.5	100%	0%	None	Easton (rural and residential)
5	192.1	50.5	90%	10%	Drop-off	St. Joseph (in-town commercial)
6	198.4	44	100%	0%	Drop-off	St. Joseph (residential)
7	169.5	40.4	60%	40%	Drop-off	St. Joseph (residential)
8	206.9	48.7	100%	0%	None	Plattsburg (residential)
9	231.1	48.1	100%	0%	Drop-off	St. Joseph (residential)
10	313.9	61.9	100%	0%	Drop-off	St. Joseph (city residential)
11	211.9	50.7	100%	0%	Drop-off	St. Joseph (residential)
12	235.6	51.6	100%	0%	Drop-off	St. Joseph (residentail)
<b>TOTALS</b>	<b>2721.3</b>	<b>614.1</b>				
<b>AVERAGE</b>	<b>226.775</b>	<b>51.2</b>	<b>95%</b>	<b>5%</b>		

TABLE 20-1

**ST. JOSEPH SANITARY LANDFILL****SORT # 1**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	220.2	84.5	18.4	7.0	8.09%	13.75%
Newsprint	264.5	41.5	22.0	3.5	9.72%	6.75%
Magazines	132.2	12.2	11.0	1.0	4.86%	1.99%
High Grade	49.3	11.8	4.1	1.0	1.81%	1.92%
Mixed	397.6	115.3	33.1	9.6	14.61%	18.76%
<b>PAPER TOTALS</b>	<b>1063.8</b>	<b>265.3</b>	<b>88.7</b>	<b>22.1</b>	<b>39.09%</b>	<b>43.17%</b>
Clear	84.7	8.4	7.1	0.7	3.11%	1.37%
Brown	47.6	4.2	4.0	0.4	1.75%	0.68%
Green	17.7	1.5	1.5	0.1	0.65%	0.24%
Other	14.9	1.8	1.2	0.2	0.55%	0.29%
<b>GLASS TOTALS</b>	<b>164.9</b>	<b>15.9</b>	<b>13.7</b>	<b>1.3</b>	<b>6.06%</b>	<b>2.59%</b>
Alum. Cans	39.5	13.8	3.3	1.2	1.45%	2.25%
Other Alum	24.0	7.4	2.0	0.6	0.88%	1.20%
Non ferrous	3.1	0.4	0.3	0.0	0.11%	0.07%
Food Cans	113.6	20.5	9.5	1.7	4.17%	3.34%
Ferrous	19.2	2.6	1.6	0.2	0.71%	0.42%
Oil Filters	0.0	0.0	0.0	0.0	0.00%	0.00%
<b>METAL TOTALS</b>	<b>199.4</b>	<b>44.7</b>	<b>16.6</b>	<b>3.7</b>	<b>7.33%</b>	<b>7.27%</b>
PET # 1	63.8	30.5	5.3	2.5	2.34%	4.96%
HDPE # 2	55.5	29.8	4.6	2.5	2.04%	4.85%
Film	101.0	55.5	8.4	4.6	3.71%	9.03%
Other Plastic	161.6	69.0	13.5	5.8	5.94%	11.23%
<b>PLASTIC TOTALS</b>	<b>381.9</b>	<b>184.8</b>	<b>31.8</b>	<b>15.4</b>	<b>14.03%</b>	<b>30.07%</b>
Food Waste	584.6	58.0	48.7	4.8	21.48%	9.44%
Wood Waste	42.1	5.5	3.5	0.5	1.55%	0.89%
Textiles	63.2	10.8	5.3	0.9	2.32%	1.76%
Diapers	74.8	8.4	6.2	0.7	2.75%	1.37%
Other Organics	46.2	7.9	3.9	0.7	1.70%	1.29%
<b>ORGANIC TOTALS</b>	<b>810.9</b>	<b>90.6</b>	<b>67.6</b>	<b>7.6</b>	<b>29.80%</b>	<b>14.74%</b>
Fines	58.4	10.1	4.9	0.8	2.15%	1.64%
Other Inorganics	34.5	2.7	2.9	0.2	1.27%	0.44%
<b>INORGANIC TOTALS</b>	<b>92.9</b>	<b>12.8</b>	<b>7.7</b>	<b>1.1</b>	<b>3.41%</b>	<b>2.08%</b>
<b>OTHER WASTE</b>	<b>7.5</b>	<b>0.5</b>	<b>0.6</b>	<b>0.0</b>	<b>0.28%</b>	<b>0.08%</b>
<b>GRAND TOTAL</b>	<b>2721.3</b>	<b>614.6</b>	<b>226.8</b>	<b>51.2</b>	<b>100.00%</b>	<b>100.00%</b>



## **SORT #2**

### **Sort Conditions**

The second sort was conducted June 9-10, 1997. The same location was used for sort activities as in Sort #1. The weather was sunny and windy.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	1,598,369
Total Sample Weight (lbs)	3188.3
Significance Test Results	.000
Number of Samples Collected	12

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	1	Beauty/Hygiene Aerosol Products	1
Prescription Medication (Rx)	7	Household Cleaning Aerosol Products	4
Beauty/Hygiene Products	15	Gardening/Yard Care Products	0
Household Cleaning Products	3	Pet Groom Products	0
Sharps/Blades	3	Disposable Razors	4
Syringes	1	Alkaline Batteries	38
Hardware/Shop Products	2	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	8		
Miscellaneous items: 1 thermostat fixture with mercury, 3 butane cigarette lighters.			
Total Weight (lb): 13.0 Total Volume (cubic ft.): 1.5			

**ST. JOSEPH SANITARY LANDFILL**  
**SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	284.9	50	100%	0%	Drop-off	St. Joseph (in-town)
2	202.6	61.1	100%	0%	Drop-off	St. Joseph (in-town)
3	319.5	56.3	100%	0%	Drop-off	St. Joseph (in-town)
4	258.8	53.9	70%	30%	Drop-off	St. Joseph (in-town)
5	297.4	63.3	100%	0%	Drop-off	St. Joseph (in-town)
6	275.4	57.8	100%	0%	Drop-off	St. Joseph (in-town)
7	203.8	53.7	50%	50%	Drop-off	St. Joseph (in-town)
8	242.8	53.6	50%	50%	Drop-off	St. Joseph (in-town)
9	259.3	58.1	50%	50%	Drop-off	St. Joseph (in-town)
10	316.5	55.5	50%	50%	Drop-off	St. Joseph (in-town)
11	226.2	61.6	80%	20%	Drop-off	St. Joseph (in-town)
12	301.3	65.7	80%	20%	Drop-off	St. Joseph (in-town)
<b>TOTALS</b>	<b>3188.5</b>	<b>690.6</b>				
<b>AVERAGE</b>	<b>265.7083</b>	<b>57.6</b>	<b>78%</b>	<b>22%</b>		

TABLE 20-3



# ST. JOSEPH SANITARY LANDFILL

**SORT # 2**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	225.0	76.0	18.8	6.3	7.06%	11.00%
Newsprint	467.6	55.3	39.0	4.6	14.67%	8.00%
Magazines	58.1	8.8	4.8	0.7	1.82%	1.27%
High Grade	95.4	14.4	8.0	1.2	2.99%	2.08%
Mixed	422.1	123.7	35.2	10.3	13.24%	17.90%
<b>PAPER TOTALS</b>	<b>1268.2</b>	<b>278.2</b>	<b>105.7</b>	<b>23.2</b>	<b>39.78%</b>	<b>40.26%</b>
Clear	107.4	7.5	9.0	0.6	3.37%	1.09%
Brown	105.1	10.4	8.8	0.9	3.30%	1.51%
Green	10.8	0.8	0.9	0.1	0.34%	0.12%
Other	8.5	1.2	0.7	0.1	0.27%	0.17%
<b>GLASS TOTALS</b>	<b>231.8</b>	<b>19.9</b>	<b>19.3</b>	<b>1.7</b>	<b>7.27%</b>	<b>2.88%</b>
Alum. Cans	42.9	26.0	3.6	2.2	1.35%	3.76%
Other Alum	20.9	8.6	1.7	0.7	0.66%	1.24%
Non ferrous	0.9	0.4	0.1	0.0	0.03%	0.06%
Food Cans	95.0	24.0	7.9	2.0	2.98%	3.47%
Ferrous	40.8	5.4	3.4	0.5	1.28%	0.78%
Oil Filters	1.2	0.1	0.1	0.0	0.04%	0.01%
<b>METAL TOTALS</b>	<b>201.7</b>	<b>64.5</b>	<b>16.8</b>	<b>5.4</b>	<b>6.33%</b>	<b>9.33%</b>
PET # 1	37.9	22.1	3.2	1.8	1.19%	3.20%
HDPE # 2	69.4	42.2	5.8	3.5	2.18%	6.11%
Film	102.9	50.0	8.6	4.2	3.23%	7.24%
Other Plastic	166.9	90.6	13.9	7.6	5.23%	13.11%
<b>PLASTIC TOTALS</b>	<b>377.1</b>	<b>204.9</b>	<b>31.4</b>	<b>17.1</b>	<b>11.83%</b>	<b>29.65%</b>
Food Waste	623.1	53.0	51.9	4.4	19.54%	7.67%
Wood Waste	8.5	2.0	0.7	0.2	0.27%	0.29%
Textiles	110.1	20.4	9.2	1.7	3.45%	2.95%
Diapers	89.5	8.7	7.5	0.7	2.81%	1.26%
Other Organics	136.6	23.2	11.4	1.9	4.28%	3.36%
<b>ORGANIC TOTALS</b>	<b>967.8</b>	<b>107.3</b>	<b>80.7</b>	<b>8.9</b>	<b>30.36%</b>	<b>15.53%</b>
Fines	101.1	12.9	8.4	1.1	3.17%	1.87%
Other Inorganics	27.6	1.8	2.3	0.2	0.87%	0.26%
<b>INORGANIC TOTALS</b>	<b>128.7</b>	<b>14.7</b>	<b>10.7</b>	<b>1.2</b>	<b>4.04%</b>	<b>2.13%</b>
<b>OTHER WASTE</b>	<b>13.0</b>	<b>1.5</b>	<b>1.1</b>	<b>0.1</b>	<b>0.41%</b>	<b>0.22%</b>
<b>GRAND TOTAL</b>	<b>3188.3</b>	<b>691.0</b>	<b>265.7</b>	<b>57.6</b>	<b>100.00%</b>	<b>100.00%</b>

### **SORT #3**

#### **Sort Conditions**

The third sort was conducted September 17-19, 1997. The same location was used for sort activities as in the previous sort. The weather was hot and humid.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	1,598,369
<b>Total Sample Weight (lbs)</b>	1252.0
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	6

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	0	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	0	<b>Household Cleaning Aerosol Products</b>	1
<b>Beauty/Hygiene Products</b>	3	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	0	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	0
<b>Syringes</b>	21	<b>Alkaline Batteries</b>	20
<b>Hardware/Shop Products</b>	1	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> 2 cans of paint, 4 containers of oil, 1 butane lighter.			
<b>Total Weight (lb): 16.0</b>			
<b>Total Volume (cubic ft.): 1.0</b>			



**ST. JOSEPH SANITARY LANDFILL  
SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	223.2	60.4	90%	10%	Drop-off	St. Joseph
2	222.6	52.7	90%	10%	Drop-off	St. Joseph
3	143.9	42.7	90%	10%	Drop-off	St. Joseph
4	185.9	44.1	80%	20%	Drop-off	St. Joseph
5	314.1	65.8	90%	10%	None	Holt County
6	162.4	43.7	95%	5%	Drop-off	St. Joseph
<b>TOTALS</b>	<b>1252.1</b>	<b>309.2</b>				
<b>AVERAGE</b>	<b>208.6833</b>	<b>51.5</b>	<b>89%</b>	<b>11%</b>		

TABLE 20-5

**ST. JOSEPH SANITARY LANDFILL****SORT # 3**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	99.5	40.8	16.6	6.8	7.94%	13.20%
Newsprint	138.0	18.5	23.0	3.1	11.02%	5.98%
Magazines	68.7	7.5	11.4	1.3	5.48%	2.43%
High Grade	50.5	9.9	8.4	1.7	4.03%	3.20%
Mixed	157.0	50.0	26.2	8.3	12.54%	16.17%
<b>PAPER TOTALS</b>	<b>513.5</b>	<b>126.7</b>	<b>85.6</b>	<b>21.1</b>	<b>41.01%</b>	<b>40.98%</b>
Clear	30.5	3.5	5.1	0.6	2.44%	1.13%
Brown	10.0	2.1	1.7	0.4	0.79%	0.68%
Green	5.7	0.8	0.9	0.1	0.45%	0.26%
Other	10.6	1.4	1.8	0.2	0.84%	0.45%
<b>GLASS TOTALS</b>	<b>56.7</b>	<b>7.8</b>	<b>9.4</b>	<b>1.3</b>	<b>4.52%</b>	<b>2.52%</b>
Alum. Cans	19.5	10.8	3.3	1.8	1.56%	3.49%
Other Alum	9.0	5.2	1.5	0.9	0.72%	1.68%
Non ferrous	2.5	0.4	0.4	0.1	0.20%	0.13%
Food Cans	36.7	9.6	6.1	1.6	2.93%	3.10%
Ferrous	45.2	2.7	7.5	0.5	3.61%	0.87%
Oil Filters	2.0	1.0	0.3	0.2	0.16%	0.32%
<b>METAL TOTALS</b>	<b>114.9</b>	<b>29.7</b>	<b>19.2</b>	<b>5.0</b>	<b>9.18%</b>	<b>9.61%</b>
PET # 1	11.0	8.8	1.8	1.5	0.88%	2.85%
HDPE # 2	26.0	18.5	4.3	3.1	2.08%	5.98%
Film	38.3	21.7	6.4	3.6	3.06%	7.02%
Other Plastic	72.0	43.0	12.0	7.2	5.75%	13.91%
<b>PLASTIC TOTALS</b>	<b>147.2</b>	<b>92.0</b>	<b>24.5</b>	<b>15.3</b>	<b>11.76%</b>	<b>29.75%</b>
Food Waste	200.3	19.5	33.4	3.3	15.99%	6.31%
Wood Waste	9.7	2.2	1.6	0.4	0.77%	0.71%
Textiles	56.8	11.5	9.5	1.9	4.53%	3.72%
Diapers	36.2	4.4	6.0	0.7	2.89%	1.42%
Other Organics	27.0	6.0	4.5	1.0	2.16%	1.94%
<b>ORGANIC TOTALS</b>	<b>329.9</b>	<b>43.6</b>	<b>55.0</b>	<b>7.3</b>	<b>26.35%</b>	<b>14.10%</b>
Fines	40.9	4.5	6.8	0.8	3.27%	1.46%
Other Inorganics	33.0	3.9	5.5	0.7	2.63%	1.26%
<b>INORGANIC TOTALS</b>	<b>73.9</b>	<b>8.4</b>	<b>12.3</b>	<b>1.4</b>	<b>5.90%</b>	<b>2.72%</b>
<b>OTHER WASTE</b>	<b>16.0</b>	<b>1.0</b>	<b>2.7</b>	<b>0.2</b>	<b>1.28%</b>	<b>0.32%</b>
<b>GRAND TOTAL</b>	<b>1252.0</b>	<b>309.2</b>	<b>208.7</b>	<b>51.5</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 20-6



## **SORT SUMMARY**

### **Seasonal variations**

- The volume of newsprint was larger than usual due to the St. Joseph News Press and the Kansas City Star.
- Glass totals increased during the second sort (in the summer). There were more beverage bottles.
- Food waste seemed larger than normal.

### **Sort results**

- Chart 20-1 graphically compares the three seasonal sort results and shows the average waste composition, by major category, for St. Joseph.
- The sample data for all St. Joseph waste sorts are listed on Table 20-7.
- The sort results for St. Joseph are listed on Table 20-8.
- The summary of statistical relevance for the St. Joseph sorts is located on page 324.
- The total for all “other wastes” found during the St. Joseph sorts is on page 324.

**All weights are in pounds and volumes are listed in cubic feet.**

Comparisons of the St. Joseph’s waste stream to previous studies and other communities can be found in Chapter 24.

## ST. JOSEPH RESULTS BY WEIGHT

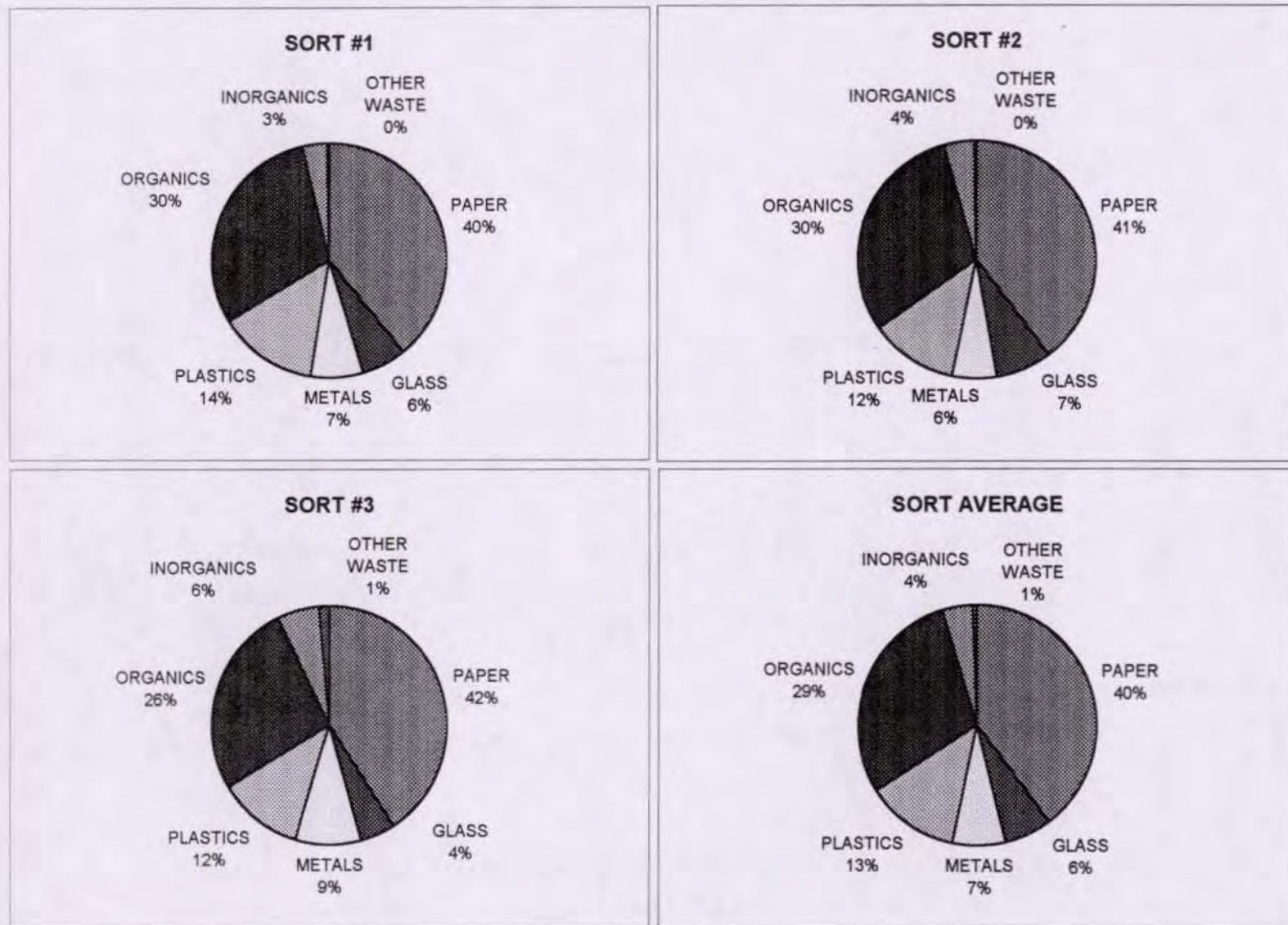


CHART 20-1



# ST. JOSEPH SAMPLE SUMMARY

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	3/10-3/11	12	3188.5	690.6	78%	22%
2	6/9-6/10	12	2721.3	614.1	95%	5%
3	9/18-9/19	6	1252.1	309.2	89%	11%
TOTALS		30.0	7161.9	1613.9		
AVERAGE		10.0	2387.3	538.0	87%	13%

TABLE 20-7

CATEGORY	ST. JOSEPH						SUMMARY	
	SORT # 1		SORT # 2		SORT #3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	8.1%	13.7%	7.1%	11.0%	7.9%	13.2%	7.6%	12.5%
Newsprint	9.7%	6.8%	14.7%	8.0%	11.0%	6.0%	12.1%	7.1%
Magazines	4.9%	2.0%	1.8%	1.3%	5.5%	2.4%	3.6%	1.8%
High Grade	1.8%	1.9%	3.0%	2.1%	4.0%	3.2%	2.7%	2.2%
Mixed	14.6%	18.8%	13.2%	17.9%	12.5%	16.2%	13.6%	17.9%
<b>PAPER TOTALS</b>	<b>39.1%</b>	<b>43.2%</b>	<b>39.8%</b>	<b>40.3%</b>	<b>41.0%</b>	<b>41.0%</b>	<b>39.7%</b>	<b>41.5%</b>
Clear	3.1%	1.4%	3.4%	1.1%	2.4%	1.1%	3.1%	1.2%
Brown	1.7%	0.7%	3.3%	1.5%	0.8%	0.7%	2.3%	1.0%
Green	0.7%	0.2%	0.3%	0.1%	0.5%	0.3%	0.5%	0.2%
Other	0.5%	0.3%	0.3%	0.2%	0.8%	0.5%	0.5%	0.3%
<b>GLASS TOTALS</b>	<b>6.1%</b>	<b>2.6%</b>	<b>7.3%</b>	<b>2.9%</b>	<b>4.5%</b>	<b>2.5%</b>	<b>6.3%</b>	<b>2.7%</b>
Alum. Cans	1.5%	2.2%	1.3%	3.8%	1.6%	3.5%	1.4%	3.1%
Other Alum	0.9%	1.2%	0.7%	1.2%	0.7%	1.7%	0.8%	1.3%
Non ferrous	0.1%	0.1%	0.0%	0.1%	0.2%	0.1%	0.1%	0.1%
Food Cans	4.2%	3.3%	3.0%	3.5%	2.9%	3.1%	3.4%	3.4%
Ferrous	0.7%	0.4%	1.3%	0.8%	3.6%	0.9%	1.5%	0.7%
Oil Filters	0.0%	0.0%	0.0%	0.0%	0.2%	0.3%	0.0%	0.1%
<b>METAL TOTALS</b>	<b>7.3%</b>	<b>7.3%</b>	<b>6.3%</b>	<b>9.3%</b>	<b>9.2%</b>	<b>9.6%</b>	<b>7.2%</b>	<b>8.6%</b>
PET # 1	2.3%	5.0%	1.2%	3.2%	0.9%	2.8%	1.6%	3.8%
HDPE # 2	2.0%	4.8%	2.2%	6.1%	2.1%	6.0%	2.1%	5.6%
Film	3.7%	9.0%	3.2%	7.2%	3.1%	7.0%	3.4%	7.9%
Other Plastic	5.9%	11.2%	5.2%	13.1%	5.8%	13.9%	5.6%	12.5%
<b>PLASTIC TOTALS</b>	<b>14.0%</b>	<b>30.1%</b>	<b>11.8%</b>	<b>29.7%</b>	<b>11.8%</b>	<b>29.8%</b>	<b>12.7%</b>	<b>29.8%</b>
Food Waste	21.5%	9.4%	19.5%	7.7%	16.0%	6.3%	19.7%	8.1%
Wood Waste	1.5%	0.9%	0.3%	0.3%	0.8%	0.7%	0.8%	0.6%
Textiles	2.3%	1.8%	3.5%	3.0%	4.5%	3.7%	3.2%	2.6%
Diapers	2.7%	1.4%	2.8%	1.3%	2.9%	1.4%	2.8%	1.3%
Other Organics	1.7%	1.3%	4.3%	3.4%	2.2%	1.9%	2.9%	2.3%
<b>ORGANIC TOTALS</b>	<b>29.8%</b>	<b>14.7%</b>	<b>30.4%</b>	<b>15.5%</b>	<b>26.4%</b>	<b>14.1%</b>	<b>29.4%</b>	<b>15.0%</b>
Fines	2.1%	1.6%	3.2%	1.9%	3.3%	1.5%	2.8%	1.7%
Other Inorganics	1.3%	0.4%	0.9%	0.3%	2.6%	1.3%	1.3%	0.5%
<b>INORGANIC TOTALS</b>	<b>3.4%</b>	<b>2.1%</b>	<b>4.0%</b>	<b>2.1%</b>	<b>5.9%</b>	<b>2.7%</b>	<b>4.1%</b>	<b>2.2%</b>
<b>OTHER WASTE</b>	<b>0.3%</b>	<b>0.1%</b>	<b>0.4%</b>	<b>0.2%</b>	<b>1.3%</b>	<b>0.4%</b>	<b>0.5%</b>	<b>0.2%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 20-8



St. Joseph Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	4,795,108
Total Sample Weight (lbs)	7161.6
Significance Test Results	.000
Number of Samples Collected	30
Mean Sample (lbs) and Confidence Interval (95%)	237.51 (+/-) 19.08

St. Joseph "Other Waste" Summary			
Over-the-counter Medication (OTC)	3	Beauty/Hygiene Aerosol Products	2
Prescription Medication (Rx)	8	Household Cleaning Aerosol Products	7
Beauty/Hygiene Products	23	Gardening/Yard Care Products	0
Household Cleaning Products	3	Pet Groom Products	0
Sharps/Blades	3	Disposable Razors	29
Syringes	23	Alkaline Batteries	69
Hardware/Shop Products	3	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	12		
Miscellaneous items: 1 shotgun shell, 1 thermostat fixture with mercury, 4 butane cigarette lighters, 2 cans of paint, 4 containers of oil.			
Total Weight (lb): 36.5 Total Volume (cubic ft.): 2.5			



## Chapter 21: Mooresville

### COMMUNITY PROFILE

The City of Mooresville is located in Livingston County and is part of the Northern Missouri Solid Waste Management District (District B). It is approximately 7 miles west of Chillicothe, MO on Highway 36. Mooresville is relatively small, and Chillicothe is the central industrial location for this area and is also the county seat. Farmer's Landfill is located on the eastern side of Mooresville near Highway 36. Mooresville is approximately 238 miles northwest of St. Louis, 369 miles north of Springfield, and 91 miles northeast of Kansas City.

#### Demographics:

	<b>Mooresville</b>	<b>Livingston County</b>
Area (sq. miles)	.18	534.55
Population (1990)	113	14,592
Density (per sq. mile)	622.81	27.30
Pop. Change since 1980	-9.6%	-7.3%
Number of households	37	5,652
Persons per household	3.10	2.44
High school graduates	36.8%	40.9%
Median Family Income	\$20,938	\$27,647
Percent below poverty level	0%	15.1%



### **Solid Waste Collection**

Farmer's Landfill has contracted with the Chillicothe and Bethany transfer stations to receive their solid waste. Most other towns are open to competition among individual haulers. Chillicothe and Grant city have curbside recycling. There are no solid waste zones or territories.

### **Solid Waste Disposal**

The Longview Company owns and operates Farmer's Landfill in Mooresville and the transfer station in Bethany. Farmer's Landfill accepts waste from Livingston, Carroll, and Harrison Counties and from other surrounding areas. The landfill receives approximately 19,000 tons of waste per year and the current gate tipping fee is \$25.00 per ton.

### **Waste Reduction and Recycling Programs**

Chillicothe is very aggressive with their recycling programs. In 1990, Chillicothe switched from a flat-rate pricing system to a unit-based pricing system for solid waste services (pay-per-bag). Recycling is mandatory in the city. The City contracts with Hope Have, a sheltered workshop, which accepts tin, aluminum, glass, plastics #1 and #2, and mixed paper (the workshop owns a pelletizer). The City delivers approximately 1503 tons of paper and 181 tons of other recyclables per year. Chillicothe has curbside recycling and drop-off locations. A few other towns also have curbside and/or drop-off recycling centers.

### **Mooresville Results**

Information about sample size and composition are listed in tables 21-1 to 21-8.

**All weights are listed in pounds and all volumes are in cubic feet.**

## **SORT #1**

### **Sort Conditions**

The first sort was conducted March 17-18, 1997. A site towards the front of the landfill was selected as site location. The weather was windy and rainy.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	515,015
<b>Total Sample Weight (lbs)</b>	2560.8
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	11

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	1	<b>Beauty/Hygiene Aerosol Products</b>	1
<b>Prescription Medication (Rx)</b>	0	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	1	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	0	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	8
<b>Syringes</b>	11	<b>Alkaline Batteries</b>	11
<b>Hardware/Shop Products</b>	0	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> 1 bag of biohazards.			
<b>Total Weight (lb): 10.0</b>			
<b>Total Volume (cubic ft.): 1.2</b>			



# FARMER'S LANDFILL (MOORESVILLE)

## SORT # 1

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	244.9	46.7	50%	50%	None	Bethany (roll-off)
2	198.9	40.1	50%	50%	None	Bethany (roll-off)
3	224.9	45	50%	50%	None	Bethany (roll-off)
4	210.9	42.8	50%	50%	None	Bethany (roll-off)
5	276.4	47	80%	20%	Curbside	Chillicothe
6	195.3	48.2	80%	20%	Curbside	Chillicothe
7	278.9	45	50%	50%	None	Carrollton
8	201	34.7	50%	50%	None	Carrollton
9	240.6	44	50%	50%	None	Carrollton
10	194	44.1	50%	50%	None	Carrollton
11	294.9	68.2	50%	50%	None	Cameron
<b>TOTALS</b>	<b>2560.8</b>	<b>505.8</b>				
<b>AVERAGE</b>	<b>232.8</b>	<b>46.0</b>	<b>55%</b>	<b>45%</b>		

TABLE 21-1



**FARMER'S LANDFILL (MOORESVILLE)****SORT # 1**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	152.9	49.0	13.9	4.5	5.97%	9.66%
Newsprint	225.1	33.5	20.5	3.0	8.79%	6.60%
Magazines	99.4	11.9	9.0	1.1	3.88%	2.35%
High Grade	184.7	30.0	16.8	2.7	7.21%	5.91%
Mixed	451.2	92.0	41.0	8.4	17.62%	18.13%
<b>PAPER TOTALS</b>	<b>1113.3</b>	<b>216.4</b>	<b>101.2</b>	<b>19.7</b>	<b>43.47%</b>	<b>42.65%</b>
Clear	34.1	3.5	3.1	0.3	1.33%	0.69%
Brown	10.0	1.0	0.9	0.1	0.39%	0.20%
Green	5.0	0.2	0.5	0.0	0.20%	0.04%
Other	3.0	0.2	0.3	0.0	0.12%	0.04%
<b>GLASS TOTALS</b>	<b>52.1</b>	<b>4.9</b>	<b>4.7</b>	<b>0.4</b>	<b>2.03%</b>	<b>0.97%</b>
Alum. Cans	44.4	12.5	4.0	1.1	1.73%	2.46%
Other Alum	20.7	3.8	1.9	0.3	0.81%	0.75%
Non ferrous	9.5	0.9	0.9	0.1	0.37%	0.18%
Food Cans	79.2	23.2	7.2	2.1	3.09%	4.57%
Ferrous	14.6	1.2	1.3	0.1	0.57%	0.24%
Oil Filters	3.0	0.1	0.3	0.0	0.12%	0.02%
<b>METAL TOTALS</b>	<b>171.4</b>	<b>41.7</b>	<b>15.6</b>	<b>3.8</b>	<b>6.69%</b>	<b>8.22%</b>
PET # 1	40.9	18.5	3.7	1.7	1.60%	3.65%
HDPE # 2	44.6	17.5	4.1	1.6	1.74%	3.45%
Film	122.1	58.5	11.1	5.3	4.77%	11.53%
Other Plastic	175.8	47.5	16.0	4.3	6.87%	9.36%
<b>PLASTIC TOTALS</b>	<b>383.4</b>	<b>142.0</b>	<b>34.9</b>	<b>12.9</b>	<b>14.97%</b>	<b>27.99%</b>
Food Waste	405.1	40.5	36.8	3.7	15.82%	7.98%
Wood Waste	54.7	4.6	5.0	0.4	2.14%	0.91%
Textiles	67.6	14.1	6.1	1.3	2.64%	2.78%
Diapers	177.5	22.8	16.1	2.1	6.93%	4.49%
Other Organics	46.9	9.9	4.3	0.9	1.83%	1.95%
<b>ORGANIC TOTALS</b>	<b>751.8</b>	<b>91.9</b>	<b>68.3</b>	<b>8.4</b>	<b>29.36%</b>	<b>18.12%</b>
Fines	63.3	7.8	5.8	0.7	2.47%	1.54%
Other Inorganics	15.5	1.4	1.4	0.1	0.61%	0.28%
<b>INORGANIC TOTALS</b>	<b>78.8</b>	<b>9.2</b>	<b>7.2</b>	<b>0.8</b>	<b>3.08%</b>	<b>1.81%</b>
<b>OTHER WASTE</b>	<b>10.0</b>	<b>1.2</b>	<b>0.9</b>	<b>0.1</b>	<b>0.39%</b>	<b>0.24%</b>
<b>GRAND TOTAL</b>	<b>2560.8</b>	<b>507.2</b>	<b>232.8</b>	<b>46.1</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 21-2



## **SORT #2**

### **Sort Conditions**

The second sort was conducted June 11-12, 1997. An area near the composting site was selected for the site location. The weather was hot and humid.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	515,015
Total Sample Weight (lbs)	3380.1
Significance Test Results	.000
Number of Samples Collected	12

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	12	Beauty/Hygiene Aerosol Products	1
Prescription Medication (Rx)	1	Household Cleaning Aerosol Products	3
Beauty/Hygiene Products	8	Gardening/Yard Care Products	2
Household Cleaning Products	2	Pet Groom Products	0
Sharps/Blades	0	Disposable Razors	20
Syringes	0	Alkaline Batteries	31
Hardware/Shop Products	2	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	0		
Miscellaneous items: 1 package of liquid ice, 1 IV with needle, 3 bottles of acrylic paint, 1 package of firecrackers, 1 set of water paints, 1 bottle of shoe polish, 1 set of markers.			
Total Weight (lb): 13.2			
Total Volume (cubic ft.): 1.0			



**FARMER'S LANDFILL (MOORESVILLE)**  
**SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	326.1	60.8	50%	50%	Curbside/Drop-off	Chillicothe
2	271.7	43.1	50%	50%	Curbside/Drop-off	Chillicothe
3	402.5	50.4	50%	50%	Curbside/Drop-off	Chillicothe
4	250.2	57.8	50%	50%	Drop-off	Carrollton
5	294.3	51	50%	50%	Curbside/Drop-off	Chillicothe
6	254	48.5	50%	50%	Curbside/Drop-off	Chillicothe
7	298.9	53	50%	50%	Curbside/Drop-off	Chillicothe
8	292.9	57	50%	50%	Drop-off	Bethany (transfer station)
9	221.6	51.1	50%	50%	Drop-off	Bethany (transfer station)
10	294.4	59	50%	50%	Drop-off	Bethany (transfer station)
11	248	52.5	50%	50%	Curbside/Drop-off	Chillicothe
12	225.5	51.3	50%	50%	Curbside/Drop-off	Chillicothe
<b>TOTALS</b>	<b>3380.1</b>	<b>632.2</b>				
<b>AVERAGE</b>	<b>281.675</b>	<b>52.7</b>	<b>50%</b>	<b>50%</b>		

TABLE 21-3



# FARMER'S LANDFILL (MOORESVILLE)

**SORT # 2**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	247.6	69.8	20.6	5.8	7.33%	11.04%
Newsprint	315.3	41.0	26.3	3.4	9.33%	6.49%
Magazines	155.3	17.0	12.9	1.4	4.59%	2.69%
High Grade	137.6	25.7	11.5	2.1	4.07%	4.07%
Mixed	445.0	102.5	37.1	8.5	13.17%	16.21%
<b>PAPER TOTALS</b>	<b>1300.8</b>	<b>256.0</b>	<b>108.4</b>	<b>21.3</b>	<b>38.48%</b>	<b>40.49%</b>
Clear	78.3	5.9	6.5	0.5	2.32%	0.93%
Brown	17.8	1.6	1.5	0.1	0.53%	0.25%
Green	10.0	0.5	0.8	0.0	0.30%	0.08%
Other	19.2	1.9	1.6	0.2	0.57%	0.30%
<b>GLASS TOTALS</b>	<b>125.3</b>	<b>9.9</b>	<b>10.4</b>	<b>0.8</b>	<b>3.71%</b>	<b>1.57%</b>
Alum. Cans	42.5	14.9	3.5	1.2	1.26%	2.36%
Other Alum	21.5	9.5	1.8	0.8	0.64%	1.50%
Non ferrous	13.8	1.3	1.2	0.1	0.41%	0.21%
Food Cans	80.0	13.9	6.7	1.2	2.37%	2.20%
Ferrous	61.2	4.2	5.1	0.4	1.81%	0.66%
Oil Filters	5.7	0.4	0.5	0.0	0.17%	0.06%
<b>METAL TOTALS</b>	<b>224.7</b>	<b>44.2</b>	<b>18.7</b>	<b>3.7</b>	<b>6.65%</b>	<b>6.99%</b>
PET # 1	50.9	25.0	4.2	2.1	1.51%	3.95%
HDPE # 2	76.2	32.0	6.4	2.7	2.25%	5.06%
Film	150.7	55.5	12.6	4.6	4.46%	8.78%
Other Plastic	207.4	83.0	17.3	6.9	6.14%	13.13%
<b>PLASTIC TOTALS</b>	<b>485.2</b>	<b>195.5</b>	<b>40.4</b>	<b>16.3</b>	<b>14.35%</b>	<b>30.92%</b>
Food Waste	633.7	43.5	52.8	3.6	18.75%	6.88%
Wood Waste	36.2	7.6	3.0	0.6	1.07%	1.20%
Textiles	165.4	30.7	13.8	2.6	4.89%	4.86%
Diapers	94.4	10.5	7.9	0.9	2.79%	1.66%
Other Organics	164.1	19.4	13.7	1.6	4.85%	3.07%
<b>ORGANIC TOTALS</b>	<b>1093.8</b>	<b>111.7</b>	<b>91.2</b>	<b>9.3</b>	<b>32.36%</b>	<b>17.67%</b>
Fines	110.6	11.8	9.2	1.0	3.27%	1.87%
Other Inorganics	26.5	2.1	2.2	0.2	0.78%	0.33%
<b>INORGANIC TOTALS</b>	<b>137.1</b>	<b>13.9</b>	<b>11.4</b>	<b>1.2</b>	<b>4.06%</b>	<b>2.20%</b>
<b>OTHER WASTE</b>	<b>13.2</b>	<b>1.0</b>	<b>1.1</b>	<b>0.1</b>	<b>0.39%</b>	<b>0.16%</b>
<b>GRAND TOTAL</b>	<b>3380.1</b>	<b>632.2</b>	<b>281.7</b>	<b>52.7</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 21-4



### **SORT #3**

#### **Sort Conditions**

The third sort was conducted September 15-17, 1997. The same location was used for sort activities as the previous sort. The weather was sunny and mild. The maximum number of samples were not gathered due to slow hauler traffic.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	515,015
<b>Total Sample Weight (lbs)</b>	2238.4
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	9

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	1	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	0	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	1	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	1	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	0
<b>Syringes</b>	36	<b>Alkaline Batteries</b>	3
<b>Hardware/Shop Products</b>	1	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items: 1 butane lighter.</b>			
<b>Total Weight (lb): .2</b>			
<b>Total Volume (cubic ft.): 0.2</b>			

**TABLE 21-5**



**FARMER'S LANDFILL (MOORESVILLE)**  
**SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	266.2	43.4	50%	50%	Both	Chillicothe
2	299.6	49.7	50%	50%	Both	Chillicothe
3	255.9	37.3	75%	25%	Both	Wheeling, Chula, Chillicothe
4	248.7	51.3	60%	40%	Drop-off	Bethany and surrounding area
5	257.5	45.1	60%	40%	Drop-off	Bethany and surrounding area
6	250.3	45.4	60%	40%	Drop-off	Bethany and surrounding area
7	179.1	45.5	60%	40%	None	Pattonsburg, Gentry
8	231.1	40.4	60%	40%	None	Pattonsburg, Gentry
9	250.1	39	60%	40%	Drop-off	Carrollton, Hale, Tina
<b>TOTALS</b>	<b>2238.5</b>	<b>397.1</b>				
<b>AVERAGE</b>	<b>248.7222</b>	<b>44.1</b>	<b>59%</b>	<b>41%</b>		

TABLE 21-5



**FARMER'S LANDFILL (MOORESVILLE)****SORT # 3**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	135.0	33.0	15.0	3.7	6.03%	8.31%
Newsprint	222.4	23.0	24.7	2.6	9.94%	5.79%
Magazines	109.7	12.3	12.2	1.4	4.90%	3.10%
High Grade	39.6	13.0	4.4	1.4	1.77%	3.27%
Mixed	305.2	55.0	33.9	6.1	13.63%	13.84%
<b>PAPER TOTALS</b>	<b>811.9</b>	<b>136.3</b>	<b>90.2</b>	<b>15.1</b>	<b>36.27%</b>	<b>34.31%</b>
Clear	37.4	4.6	4.2	0.5	1.67%	1.16%
Brown	11.0	1.6	1.2	0.2	0.49%	0.40%
Green	1.5	0.1	0.2	0.0	0.07%	0.03%
Other	10.5	2.1	1.2	0.2	0.47%	0.53%
<b>GLASS TOTALS</b>	<b>60.4</b>	<b>8.4</b>	<b>6.7</b>	<b>0.9</b>	<b>2.70%</b>	<b>2.11%</b>
Alum. Cans	21.0	8.8	2.3	1.0	0.94%	2.21%
Other Alum	17.7	6.6	2.0	0.7	0.79%	1.66%
Non ferrous	3.9	1.4	0.4	0.2	0.17%	0.35%
Food Cans	60.3	10.2	6.7	1.1	2.69%	2.57%
Ferrous	38.3	5.0	4.3	0.6	1.71%	1.26%
Oil Filters	2.0	0.7	0.2	0.1	0.09%	0.18%
<b>METAL TOTALS</b>	<b>143.2</b>	<b>32.7</b>	<b>15.9</b>	<b>3.6</b>	<b>6.40%</b>	<b>8.23%</b>
PET # 1	27.6	13.2	3.1	1.5	1.23%	3.32%
HDPE # 2	62.7	28.4	7.0	3.2	2.80%	7.15%
Film	101.7	31.0	11.3	3.4	4.54%	7.80%
Other Plastic	148.8	47.8	16.5	5.3	6.65%	12.03%
<b>PLASTIC TOTALS</b>	<b>340.8</b>	<b>120.4</b>	<b>37.9</b>	<b>13.4</b>	<b>15.22%</b>	<b>30.30%</b>
Food Waste	331.5	29.5	36.8	3.3	14.81%	7.43%
Wood Waste	61.7	8.4	6.9	0.9	2.76%	2.11%
Textiles	109.4	18.2	12.2	2.0	4.89%	4.58%
Diapers	130.2	13.8	14.5	1.5	5.81%	3.47%
Other Organics	66.6	12.5	7.4	1.4	2.98%	3.15%
<b>ORGANIC TOTALS</b>	<b>699.4</b>	<b>82.4</b>	<b>77.7</b>	<b>9.2</b>	<b>31.24%</b>	<b>20.74%</b>
Fines	133.0	11.8	14.8	1.3	5.94%	2.97%
Other Inorganics	47.9	5.1	5.3	0.6	2.14%	1.28%
<b>INORGANIC TOTALS</b>	<b>180.9</b>	<b>16.9</b>	<b>20.1</b>	<b>1.9</b>	<b>8.08%</b>	<b>4.25%</b>
<b>OTHER WASTE</b>	<b>2.0</b>	<b>0.2</b>	<b>0.2</b>	<b>0.02</b>	<b>0.09%</b>	<b>0.05%</b>
<b>GRAND TOTAL</b>	<b>2238.4</b>	<b>397.3</b>	<b>248.7</b>	<b>44.1</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 21-6



## **SORT SUMMARY**

### **Seasonal variations**

- Paper totals were high for all sorts at this site. Even though Chillicothe has a pelletizer for their paper products, many communities around the area do not have curbside recycling.
- Glass and Plastics totals are lower than average, probably due to the curbside recycling and unit-based pricing for solid waste disposal in Chillicothe.
- Food waste increased in the second sort due to “picnic” foods (watermelon rinds, corn shucks, etc.).

### **Sort results**

- Chart 21-1 graphically compares the three seasonal sort results and shows the average waste composition, by major category, for Mooresville.
- The sample data for all Mooresville waste sorts are listed on Table 21-7.
- The sort results for Mooresville are listed on Table 21-8.
- The summary of statistical relevance for the Mooresville sorts is located on page 340.
- The total for all “other wastes” found during the Mooresville sorts is on page 340.

**All weights are in pounds and volumes are listed in cubic feet.**

Comparisons of the Mooresville’s waste stream to previous studies and other communities can be found in Chapter 24.



# MOORESVILLE RESULTS BY WEIGHT

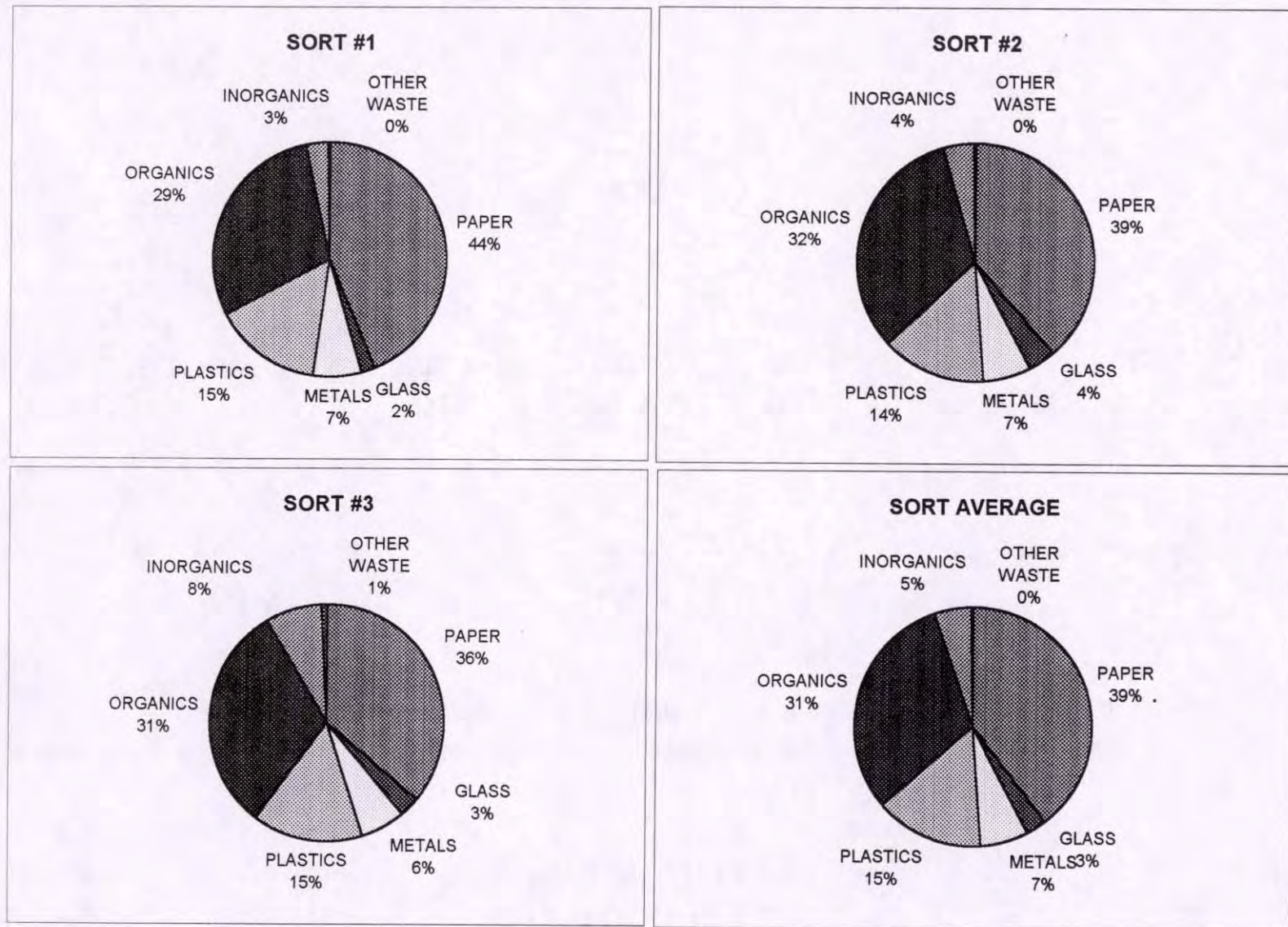


CHART 21-1



# MOORESVILLE SAMPLE SUMMARY

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	3/17-3/18	11	2560.8	505.8	55%	45%
2	6/11-6/12	12	3380.1	632.2	50%	50%
3	9/15-9/17	9	2238.5	397.1	59%	41%
TOTALS		32.0	8179.4	1535.1		
AVERAGE		10.7	2726.5	511.7	55%	45%

TABLE 21-7

CATEGORY	MOORESVILLE						SUMMARY	
	SORT # 1		SORT # 2		SORT # 3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	6.0%	9.7%	7.3%	11.0%	6.0%	8.3%	6.5%	9.9%
Newsprint	8.8%	6.6%	9.3%	6.5%	9.9%	5.8%	9.3%	6.3%
Magazines	3.9%	2.3%	4.6%	2.7%	4.9%	3.1%	4.5%	2.7%
High Grade	7.2%	5.9%	4.1%	4.1%	1.8%	3.3%	4.4%	4.5%
Mixed	17.6%	18.1%	13.2%	16.2%	13.6%	13.8%	14.7%	16.2%
<b>PAPER TOTALS</b>	<b>43.5%</b>	<b>42.7%</b>	<b>38.5%</b>	<b>40.5%</b>	<b>36.3%</b>	<b>34.3%</b>	<b>39.4%</b>	<b>39.6%</b>
Clear	1.3%	0.7%	2.3%	0.9%	1.7%	1.2%	1.8%	0.9%
Brown	0.4%	0.2%	0.5%	0.3%	0.5%	0.4%	0.5%	0.3%
Green	0.2%	0.0%	0.3%	0.1%	0.1%	0.0%	0.2%	0.1%
Other	0.1%	0.0%	0.6%	0.3%	0.5%	0.5%	0.4%	0.3%
<b>GLASS TOTALS</b>	<b>2.0%</b>	<b>1.0%</b>	<b>3.7%</b>	<b>1.6%</b>	<b>2.7%</b>	<b>2.1%</b>	<b>2.9%</b>	<b>1.5%</b>
Alum. Cans	1.7%	2.5%	1.3%	2.4%	0.9%	2.2%	1.3%	2.4%
Other Alum	0.8%	0.7%	0.6%	1.5%	0.8%	1.7%	0.7%	1.3%
Non ferrous	0.4%	0.2%	0.4%	0.2%	0.2%	0.4%	0.3%	0.2%
Food Cans	3.1%	4.6%	2.4%	2.2%	2.7%	2.6%	2.7%	3.1%
Ferrous	0.6%	0.2%	1.8%	0.7%	1.7%	1.3%	1.4%	0.7%
Oil Filters	0.1%	0.0%	0.2%	0.1%	0.1%	0.2%	0.1%	0.1%
<b>METAL TOTALS</b>	<b>6.7%</b>	<b>8.2%</b>	<b>6.6%</b>	<b>7.0%</b>	<b>6.4%</b>	<b>8.2%</b>	<b>6.6%</b>	<b>7.7%</b>
PET # 1	1.6%	3.6%	1.5%	4.0%	1.2%	3.3%	1.5%	3.7%
HDPE # 2	1.7%	3.5%	2.3%	5.1%	2.8%	7.1%	2.2%	5.1%
Film	4.8%	11.5%	4.5%	8.8%	4.5%	7.8%	4.6%	9.4%
Other Plastic	6.9%	9.4%	6.1%	13.1%	6.6%	12.0%	6.5%	11.6%
<b>PLASTIC TOTALS</b>	<b>15.0%</b>	<b>28.0%</b>	<b>14.4%</b>	<b>30.9%</b>	<b>15.2%</b>	<b>30.3%</b>	<b>14.8%</b>	<b>29.8%</b>
Food Waste	15.8%	8.0%	18.7%	6.9%	14.8%	7.4%	16.8%	7.4%
Wood Waste	2.1%	0.9%	1.1%	1.2%	2.8%	2.1%	1.9%	1.3%
Textiles	2.6%	2.8%	4.9%	4.9%	4.9%	4.6%	4.2%	4.1%
Diapers	6.9%	4.5%	2.8%	1.7%	5.8%	3.5%	4.9%	3.1%
Other Organics	1.8%	2.0%	4.9%	3.1%	3.0%	3.1%	3.4%	2.7%
<b>ORGANIC TOTALS</b>	<b>29.4%</b>	<b>18.1%</b>	<b>32.4%</b>	<b>17.7%</b>	<b>31.2%</b>	<b>20.7%</b>	<b>31.1%</b>	<b>18.6%</b>
Fines	2.5%	1.5%	3.3%	1.9%	5.9%	3.0%	3.8%	2.0%
Other Inorganics	0.6%	0.3%	0.8%	0.3%	2.1%	1.3%	1.1%	0.6%
<b>INORGANIC TOTALS</b>	<b>3.1%</b>	<b>1.8%</b>	<b>4.1%</b>	<b>2.2%</b>	<b>8.1%</b>	<b>4.3%</b>	<b>4.9%</b>	<b>2.6%</b>
<b>OTHER WASTE</b>	<b>0.4%</b>	<b>0.2%</b>	<b>0.4%</b>	<b>0.2%</b>	<b>0.7%</b>	<b>0.4%</b>	<b>0.3%</b>	<b>0.2%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 21-8



Mooreville Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	1,545,046
Total Sample Weight (lbs)	8179.3
Significance Test Results	.000
Number of Samples Collected	32
Mean Sample (lbs) and Confidence Interval (95%)	254.82 (+/-) 16.27

Mooreville "Other Waste" Summary			
Over-the-counter Medication (OTC)	14	Beauty/Hygiene Aerosol Products	2
Prescription Medication (Rx)	1	Household Cleaning Aerosol Products	3
Beauty/Hygiene Products	10	Gardening/Yard Care Products	2
Household Cleaning Products	3	Pet Groom Products	0
Sharps/Blades	0	Disposable Razors	28
Syringes	47	Alkaline Batteries	45
Hardware/Shop Products	3	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	0		
<b>Miscellaneous items:</b> 1 bag of biohazards, 1 package of liquid ice, 1 IV with needle, 3 bottles of acrylic paint, 1 package of firecrackers, 1 set of water paints, 1 bottle of shoe polish, 1 set of markers, 1 butane lighter.			
<b>Total Weight (lb): 23.4</b> <b>Total Volume (cubic ft.): 2.4</b>			



## Chapter 22: Kirksville

### COMMUNITY PROFILE

The City of Kirksville is located in Adair County in northeast Missouri. It is part of the Northeast Solid Waste Management District (District C). Kirksville is the county seat, the largest city in the county, and is home to Truman State University. It is also a central location for industry and retail. Rye Creek Sanitary Landfill is one mile northwest of Kirksville just outside of the city limits. Kirksville is approximately 204 miles northwest of St. Louis, 253 miles northeast of Springfield, and 158 miles northeast of Kansas City.

#### Demographics:

	<b>Kirksville</b>	<b>Adair County</b>
Area (sq. miles)	9.82	567.63
Population (1990)	17,152	24,577
Density (per sq. mile)	1746.86	43.30
Pop. Change since 1980	-0.1%	-1.2%
Number of households	6,291	9,047
Persons per household	2.20	2.35
High school graduates	26.1%	30.6%
Median Family Income	\$25,114	\$25,447
Percent below poverty level	30.5%	24.9%



### **Solid Waste Collection**

The City of Kirksville has contracted with Teter's Landfill in Macon, MO for residential hauling services, therefore all City of Kirksville waste goes to Macon. Most solid waste received at the Rye Creek Landfill is from rural areas.

### **Solid Waste Disposal**

Rye Creek Sanitary Landfill accepts waste from outside the city limits of Kirksville, commercial waste from Kirksville, and from the surrounding area (Edina, Memphis, Green City, and Canton). The landfill receives approximately 12,304 tons of waste per year and the current gate tipping fee is \$6.50 per yard (there is no scale at the landfill).

### **Waste Reduction and Recycling Programs**

There are two major drop-off centers in Kirksville: NEMO Recycling and Kirksville Recycles. NEMO accepts corrugated cardboard, clothing, paper, plastics, steel and aluminum cans, newsprint, magazines, and white goods. Working with Sheltered Workshop personnel, NEMO provides commingled curbside recycling for Kirksville and the surrounding areas. Approximately 14,460 tons of material were recycled by NEMO in 1996. There are a few drop-off centers in smaller towns and there are no household hazardous waste facilities or education programs currently in progress.

### **Rye Creek Sanitary Landfill Results**

Information about sample size and composition are listed in tables 22-1 to 22-8.

**All weights are listed in pounds and all volumes are in cubic feet.**



## **SORT #1**

### **Sort Conditions**

The first sort was conducted March 24-25, 1997. A site adjacent near the front office was selected as the sort location. The maximum number of samples was not collected due to slow hauler traffic.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	189,292
<b>Total Sample Weight (lbs)</b>	1844.5
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	8

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	23	<b>Beauty/Hygiene Aerosol Products</b>	2
<b>Prescription Medication (Rx)</b>	1	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	13	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	1	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	1	<b>Disposable Razors</b>	1
<b>Syringes</b>	5	<b>Alkaline Batteries</b>	2
<b>Hardware/Shop Products</b>	3	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> 1 set of acrylic paints.			
<b>Total Weight (lb): 14.4</b>			
<b>Total Volume (cubic ft.): .75</b>			

**TABLE 22-1**



**RYE CREEK SANITARY LANDFILL (KIRKSVILLE)**  
**SORT # 1**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	277.2	45	10%	90%	Curbside	Canton (business)
2	218	39.5	10%	90%	Curbside	Canton (business)
3	184.2	47.8	10%	90%	Curbside	Canton (business)
4	229	47.4	90%	10%	Drop-off	Kahoka
5	195.7	44.8	90%	10%	Drop-off	Kahoka
6	258.6	49.5	90%	10%	Drop-off	Kahoka
7	233.2	39.1	70%	30%	Drop-off	Memphis
8	248.6	49.3	70%	30%	Drop-off	Memphis
<b>TOTALS</b>	<b>1844.5</b>	<b>362.4</b>				
<b>AVERAGE</b>	<b>230.5625</b>	<b>45.3</b>	<b>55%</b>	<b>45%</b>		

TABLE 22-1



**RYE CREEK SANITARY LANDFILL (KIRKSVILLE)**

**SORT # 1**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	127.3	36.2	15.9	4.5	6.90%	9.99%
Newsprint	102.6	16.5	12.8	2.1	5.56%	4.55%
Magazines	72.4	8.9	9.1	1.1	3.93%	2.46%
High Grade	53.6	13.3	6.7	1.7	2.91%	3.67%
Mixed	278.9	64.9	34.9	8.1	15.12%	17.91%
<b>PAPER TOTALS</b>	<b>634.8</b>	<b>139.8</b>	<b>79.4</b>	<b>17.5</b>	<b>34.42%</b>	<b>38.58%</b>
Clear	41.8	3.8	5.2	0.5	2.27%	1.05%
Brown	24.4	2.5	3.1	0.3	1.32%	0.69%
Green	3.6	0.3	0.5	0.0	0.20%	0.08%
Other	12.7	1.2	1.6	0.2	0.69%	0.33%
<b>GLASS TOTALS</b>	<b>82.5</b>	<b>7.8</b>	<b>10.3</b>	<b>1.0</b>	<b>4.47%</b>	<b>2.15%</b>
Alum. Cans	21.5	7.5	2.7	0.9	1.17%	2.07%
Other Alum	14.7	2.6	1.8	0.3	0.80%	0.72%
Non ferrous	3.3	0.5	0.4	0.1	0.18%	0.14%
Food Cans	61.7	11.9	7.7	1.5	3.35%	3.28%
Ferrous	12.2	3.4	1.5	0.4	0.66%	0.94%
Oil Filters	5.8	0.4	0.7	0.1	0.31%	0.11%
<b>METAL TOTALS</b>	<b>119.2</b>	<b>26.3</b>	<b>14.9</b>	<b>3.3</b>	<b>6.46%</b>	<b>7.26%</b>
PET # 1	32.2	12.2	4.0	1.5	1.75%	3.37%
HDPE # 2	35.0	13.5	4.4	1.7	1.90%	3.73%
Film	73.7	37.0	9.2	4.6	4.00%	10.21%
Other Plastic	121.1	43.2	15.1	5.4	6.57%	11.92%
<b>PLASTIC TOTALS</b>	<b>262.0</b>	<b>105.9</b>	<b>32.8</b>	<b>13.2</b>	<b>14.20%</b>	<b>29.23%</b>
Food Waste	373.6	33.0	46.7	4.1	20.25%	9.11%
Wood Waste	6.0	1.1	0.8	0.1	0.33%	0.30%
Textiles	60.1	9.7	7.5	1.2	3.26%	2.68%
Diapers	110.6	11.7	13.8	1.5	6.00%	3.23%
Other Organics	90.8	15.8	11.4	2.0	4.92%	4.36%
<b>ORGANIC TOTALS</b>	<b>641.1</b>	<b>71.3</b>	<b>80.1</b>	<b>8.9</b>	<b>34.76%</b>	<b>19.68%</b>
Fines	75.6	8.5	9.5	1.1	4.10%	2.35%
Other Inorganics	14.9	2.0	1.9	0.3	0.81%	0.55%
<b>INORGANIC TOTALS</b>	<b>90.5</b>	<b>10.5</b>	<b>11.3</b>	<b>1.3</b>	<b>4.91%</b>	<b>2.90%</b>
<b>OTHER WASTE</b>	<b>14.4</b>	<b>0.7</b>	<b>1.8</b>	<b>0.1</b>	<b>0.78%</b>	<b>0.21%</b>
<b>GRAND TOTAL</b>	<b>1844.5</b>	<b>362.3</b>	<b>230.6</b>	<b>45.3</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 22-2



## **SORT #2**

### **Sort Conditions**

The second sort was conducted June 16-17, 1997. The same location was used for sort activities as the previous sort. The weather was mild and rainy. The maximum number of samples were not collected due to slow hauler traffic.

Statistics	
Estimated MSW (lbs) Collected by Site During Sampling Period	189,292
Total Sample Weight (lbs)	1598.9
Significance Test Results	.000
Number of Samples Collected	5

OTHER WASTE CATEGORIES			
Over-the-counter Medication (OTC)	1	Beauty/Hygiene Aerosol Products	3
Prescription Medication (Rx)	0	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	2	Gardening/Yard Care Products	0
Household Cleaning Products	0	Pet Groom Products	0
Sharps/Blades	5	Disposable Razors	6
Syringes	2	Alkaline Batteries	15
Hardware/Shop Products	0	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	0		
Miscellaneous items: None.			
Total Weight (lb): 10.2			
Total Volume (cubic ft.): 0.3			



**RYE CREEK SANITARY LANDFILL**  
**SORT # 2**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	325.6	59.8	80%	20%	Drop-off	Memphis and Kahoka
2	290.5	61.9	90%	10%	Drop-off	Memphis
3	346.9	67.7	80%	20%	Drop-off	Memphis and Kahoka
4	334.2	55.6	50%	50%	Drop-off	Memphis
5	301.5	58.4	50%	50%	Drop-off	Memphis
<b>TOTALS</b>	<b>1598.9</b>	<b>303.2</b>				
<b>AVERAGE</b>	<b>319.78</b>	<b>60.6</b>	<b>70%</b>	<b>30%</b>		

TABLE 22-3



**RYE CREEK SANITARY LANDFILL (KIRKSVILLE)      SORT # 2**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	123.7	34.2	24.7	6.8	7.74%	11.28%
Newsprint	88.9	13.0	17.8	2.6	5.56%	4.29%
Magazines	31.7	5.3	6.3	1.1	1.98%	1.75%
High Grade	68.4	11.0	13.7	2.2	4.28%	3.63%
Mixed	248.6	47.3	49.7	9.5	15.55%	15.60%
<b>PAPER TOTALS</b>	<b>561.3</b>	<b>110.8</b>	<b>112.3</b>	<b>22.2</b>	<b>35.11%</b>	<b>36.54%</b>
Clear	48.0	4.6	9.6	0.9	3.00%	1.52%
Brown	23.8	2.5	4.8	0.5	1.49%	0.82%
Green	9.8	0.8	2.0	0.2	0.61%	0.26%
Other	8.6	0.7	1.7	0.1	0.54%	0.23%
<b>GLASS TOTALS</b>	<b>90.2</b>	<b>8.6</b>	<b>18.0</b>	<b>1.7</b>	<b>5.64%</b>	<b>2.84%</b>
Alum. Cans	25.8	10.0	5.2	2.0	1.61%	3.30%
Other Alum	9.6	3.0	1.9	0.6	0.60%	0.99%
Non ferrous	6.0	0.6	1.2	0.1	0.38%	0.20%
Food Cans	41.0	8.5	8.2	1.7	2.56%	2.80%
Ferrous	22.8	2.8	4.6	0.6	1.43%	0.92%
Oil Filters	5.4	0.4	1.1	0.1	0.34%	0.13%
<b>METAL TOTALS</b>	<b>110.6</b>	<b>25.3</b>	<b>22.1</b>	<b>5.1</b>	<b>6.92%</b>	<b>8.34%</b>
PET # 1	27.3	12.0	5.5	2.4	1.71%	3.96%
HDPE # 2	35.8	17.0	7.2	3.4	2.24%	5.61%
Film	94.3	25.0	18.9	5.0	5.90%	8.25%
Other Plastic	101.7	40.0	20.3	8.0	6.36%	13.19%
<b>PLASTIC TOTALS</b>	<b>259.1</b>	<b>94.0</b>	<b>51.8</b>	<b>18.8</b>	<b>16.20%</b>	<b>31.00%</b>
Food Waste	200.4	16.5	40.1	3.3	12.53%	5.44%
Wood Waste	17.3	1.8	3.5	0.4	1.08%	0.59%
Textiles	83.6	13.5	16.7	2.7	5.23%	4.45%
Diapers	98.4	9.3	19.7	1.9	6.15%	3.07%
Other Organics	59.6	10.6	11.9	2.1	3.73%	3.50%
<b>ORGANIC TOTALS</b>	<b>459.3</b>	<b>51.7</b>	<b>91.9</b>	<b>10.3</b>	<b>28.73%</b>	<b>17.05%</b>
Fines	52.2	8.0	10.4	1.6	3.26%	2.64%
Other Inorganics	56.0	4.5	11.2	0.9	3.50%	1.48%
<b>INORGANIC TOTALS</b>	<b>108.2</b>	<b>12.5</b>	<b>21.6</b>	<b>2.5</b>	<b>6.77%</b>	<b>4.12%</b>
<b>OTHER WASTE</b>	<b>10.2</b>	<b>0.3</b>	<b>2.0</b>	<b>0.1</b>	<b>0.64%</b>	<b>0.10%</b>
<b>GRAND TOTAL</b>	<b>1598.9</b>	<b>303.2</b>	<b>319.8</b>	<b>60.6</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 22-4



### **SORT #3**

#### **Sort Conditions**

The third sort was conducted September 8-10, 1997. The same location was used for sort activities as the previous sort. The weather was sunny and mild.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	189,292
<b>Total Sample Weight (lbs)</b>	2095.3
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	11

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	0	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	0	<b>Household Cleaning Aerosol Products</b>	1
<b>Beauty/Hygiene Products</b>	3	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	0	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	2	<b>Disposable Razors</b>	11
<b>Syringes</b>	13	<b>Alkaline Batteries</b>	27
<b>Hardware/Shop Products</b>	2	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	2		
<b>Miscellaneous items:</b> 1 compressed fire detector.			
<b>Total Weight (1b): 8.2</b>			
<b>Total Volume (cubic ft.): 0.3</b>			



**RYE CREEK SANITARY LANDFILL  
SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	189	44.7	20%	80%	Curbside	Canton
2	176.2	32.8	70%	30%	Drop-off	Green City
3	177.4	43.9	70%	30%	Curbside	Canton
4	185.9	38.9	70%	30%	Drop-off	Memphis and Kahoka
5	178.3	35.8	70%	30%	Drop-off	Memphis
6	154.5	43.6	100%	0%	Drop-off	Adair County (trailers, rural areas)
7	208.3	48	100%	0%	Drop-off	Adair County (trailers, rural areas)
8	189.4	49.5	100%	0%	Drop-off	Adair County (trailers, rural areas)
9	173.3	45	70%	30%	Curbside	Edina
10	209.5	55	70%	30%	Curbside	Edina.
11	254	46.7	70%	30%	Curbside	Edina
<b>TOTALS</b>	<b>2095.3</b>	<b>484.2</b>				
<b>AVERAGE</b>	<b>190.4818</b>	<b>44.0</b>	<b>74%</b>	<b>26%</b>		

TABLE 22-5



**RYE CREEK SANITARY LANDFILL (KIRKSVILLE)      SORT # 3**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	130.0	59.0	11.8	5.4	6.20%	12.18%
Newsprint	232.6	32.3	21.1	2.9	11.10%	6.67%
Magazines	132.6	10.8	12.1	1.0	6.33%	2.23%
High Grade	55.7	13.9	5.1	1.3	2.66%	2.87%
Mixed	312.7	90.0	28.4	8.2	14.92%	18.58%
<b>PAPER TOTALS</b>	<b>863.6</b>	<b>206.0</b>	<b>78.5</b>	<b>18.7</b>	<b>41.22%</b>	<b>42.52%</b>
Clear	66.4	4.6	6.0	0.4	3.17%	0.95%
Brown	21.9	2.3	2.0	0.2	1.05%	0.47%
Green	3.0	0.4	0.3	0.0	0.14%	0.08%
Other	7.2	2.9	0.7	0.3	0.34%	0.60%
<b>GLASS TOTALS</b>	<b>98.5</b>	<b>10.2</b>	<b>9.0</b>	<b>0.9</b>	<b>4.70%</b>	<b>2.11%</b>
Alum. Cans	24.3	12.3	2.2	1.1	1.16%	2.54%
Other Alum	13.5	7.2	1.2	0.7	0.64%	1.49%
Non ferrous	1.0	0.1	0.1	0.0	0.05%	0.02%
Food Cans	44.8	9.8	4.1	0.9	2.14%	2.02%
Ferrous	15.9	2.5	1.4	0.2	0.76%	0.52%
Oil Filters	1.2	0.1	0.1	0.0	0.06%	0.02%
<b>METAL TOTALS</b>	<b>100.7</b>	<b>32.0</b>	<b>9.2</b>	<b>2.9</b>	<b>4.81%</b>	<b>6.61%</b>
PET # 1	24.6	15.7	2.2	1.4	1.17%	3.24%
HDPE # 2	54.2	33.0	4.9	3.0	2.59%	6.81%
Film	76.0	47.0	6.9	4.3	3.63%	9.70%
Other Plastic	131.8	65.3	12.0	5.9	6.29%	13.48%
<b>PLASTIC TOTALS</b>	<b>286.6</b>	<b>161.0</b>	<b>26.1</b>	<b>14.6</b>	<b>13.68%</b>	<b>33.23%</b>
Food Waste	418.7	33.5	38.1	3.0	19.98%	6.92%
Wood Waste	7.5	1.8	0.7	0.2	0.36%	0.37%
Textiles	73.8	12.6	6.7	1.1	3.52%	2.60%
Diapers	71.3	7.4	6.5	0.7	3.40%	1.53%
Other Organics	49.0	5.5	4.5	0.5	2.34%	1.14%
<b>ORGANIC TOTALS</b>	<b>620.3</b>	<b>60.8</b>	<b>56.4</b>	<b>5.5</b>	<b>29.61%</b>	<b>12.55%</b>
Fines	62.0	8.1	5.6	0.7	2.96%	1.66%
Other Inorganics	55.3	6.1	5.0	0.6	2.64%	1.26%
<b>INORGANIC TOTALS</b>	<b>117.3</b>	<b>14.2</b>	<b>10.7</b>	<b>1.3</b>	<b>5.60%</b>	<b>2.92%</b>
<b>OTHER WASTE</b>	<b>8.3</b>	<b>0.3</b>	<b>0.8</b>	<b>0.03</b>	<b>0.39%</b>	<b>0.06%</b>
<b>GRAND TOTAL</b>	<b>2095.3</b>	<b>484.4</b>	<b>190.5</b>	<b>44.0</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 22-6



## **SORT SUMMARY**

### **Seasonal variations**

- The percentage of cardboard was a high. The types of cardboard usually consisted of pizza boxes and cereal boxes (common in a college town).
- Food waste decreased in the second round. This was probably the result of college students leaving for the summer.
- Hauler traffic at this particular site was extremely slow. The slowest time was during the second round.

### **Sort results**

- Chart 22-1 graphically compares the three seasonal sort results and shows the average waste composition, by major category, for Kirksville.
- The sample data for all Kirksville waste sorts are listed on Table 22-7.
- The sort results for Kirksville are listed on Table 22-8.
- The summary of statistical relevance for the Kirksville sorts is located on page 356.
- The total for all “other wastes” found during the Kirksville sorts is on page 356.

**All weights are in pounds and volumes are listed in cubic feet.**

Comparisons of the Kirksville’s waste stream to previous studies and other communities can be found in Chapter 24.

## KIRKSVILLE RESULTS BY WEIGHT

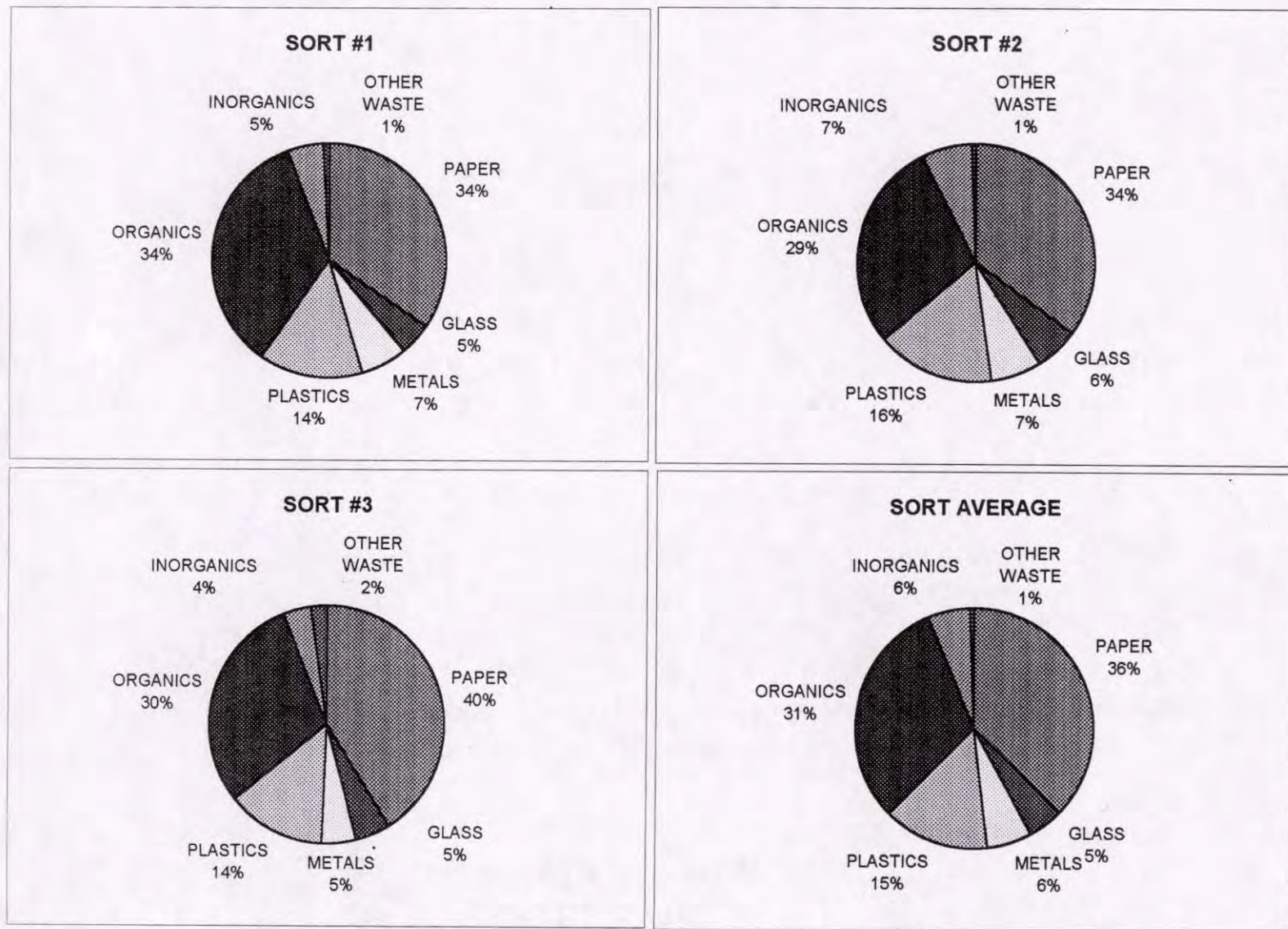


CHART 22-1



# **KIRKSVILLE SAMPLE SUMMARY**

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	3/24-3/25	8	1844.5	362.4	55%	45%
2	6/16-6/17	11	2095.3	484.2	74%	26%
3	9/18-9/10	5	1598.9	303.2	70%	30%
<b>TOTALS</b>		<b>24.0</b>	<b>5538.7</b>	<b>1149.8</b>		
<b>AVERAGE</b>		<b>8.0</b>	<b>1846.2</b>	<b>383.3</b>	<b>66%</b>	<b>34%</b>

TABLE 22-7



CATEGORY	KIRKSVILLE						SUMMARY	
	SORT # 1		SORT # 2		SORT # 3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	6.9%	10.0%	7.7%	11.3%	6.2%	12.2%	6.9%	11.3%
Newsprint	5.6%	4.6%	5.6%	4.3%	11.1%	6.7%	7.7%	5.4%
Magazines	3.9%	2.5%	2.0%	1.7%	6.3%	2.2%	4.3%	2.2%
High Grade	2.9%	3.7%	4.3%	3.6%	2.7%	2.9%	3.2%	3.3%
Mixed	15.1%	17.9%	15.5%	15.6%	14.9%	18.6%	15.2%	17.6%
<b>PAPER TOTALS</b>	<b>34.4%</b>	<b>38.6%</b>	<b>35.1%</b>	<b>36.5%</b>	<b>41.2%</b>	<b>42.5%</b>	<b>37.2%</b>	<b>39.7%</b>
Clear	2.3%	1.0%	3.0%	1.5%	3.2%	0.9%	2.8%	1.1%
Brown	1.3%	0.7%	1.5%	0.8%	1.0%	0.5%	1.3%	0.6%
Green	0.2%	0.1%	0.6%	0.3%	0.1%	0.1%	0.3%	0.1%
Other	0.7%	0.3%	0.5%	0.2%	0.3%	0.6%	0.5%	0.4%
<b>GLASS TOTALS</b>	<b>4.5%</b>	<b>2.2%</b>	<b>5.6%</b>	<b>2.8%</b>	<b>4.7%</b>	<b>2.1%</b>	<b>4.9%</b>	<b>2.3%</b>
Alum. Cans	1.2%	2.1%	1.6%	3.3%	1.2%	2.5%	1.3%	2.6%
Other Alum	0.8%	0.7%	0.6%	1.0%	0.6%	1.5%	0.7%	1.1%
Non ferrous	0.2%	0.1%	0.4%	0.2%	0.0%	0.0%	0.2%	0.1%
Food Cans	3.3%	3.3%	2.6%	2.8%	2.1%	2.0%	2.7%	2.6%
Ferrous	0.7%	0.9%	1.4%	0.9%	0.8%	0.5%	0.9%	0.8%
Oil Filters	0.3%	0.1%	0.3%	0.1%	0.1%	0.0%	0.2%	0.1%
<b>METAL TOTALS</b>	<b>6.5%</b>	<b>7.3%</b>	<b>6.9%</b>	<b>8.3%</b>	<b>4.8%</b>	<b>6.6%</b>	<b>6.0%</b>	<b>7.3%</b>
PET # 1	1.7%	3.4%	1.7%	4.0%	1.2%	3.2%	1.5%	3.5%
HDPE # 2	1.9%	3.7%	2.2%	5.6%	2.6%	6.8%	2.3%	5.5%
Film	4.0%	10.2%	5.9%	8.2%	3.6%	9.7%	4.4%	9.5%
Other Plastic	6.6%	11.9%	6.4%	13.2%	6.3%	13.5%	6.4%	12.9%
<b>PLASTIC TOTALS</b>	<b>14.2%</b>	<b>29.2%</b>	<b>16.2%</b>	<b>31.0%</b>	<b>13.7%</b>	<b>33.2%</b>	<b>14.6%</b>	<b>31.4%</b>
Food Waste	20.3%	9.1%	12.5%	5.4%	20.0%	6.9%	17.9%	7.2%
Wood Waste	0.3%	0.3%	1.1%	0.6%	0.4%	0.4%	0.6%	0.4%
Textiles	3.3%	2.7%	5.2%	4.5%	3.5%	2.6%	3.9%	3.1%
Diapers	6.0%	3.2%	6.2%	3.1%	3.4%	1.5%	5.1%	2.5%
Other Organics	4.9%	4.4%	3.7%	3.5%	2.3%	1.1%	3.6%	2.8%
<b>ORGANIC TOTALS</b>	<b>34.7%</b>	<b>19.7%</b>	<b>28.7%</b>	<b>17.1%</b>	<b>29.6%</b>	<b>12.6%</b>	<b>31.1%</b>	<b>16.0%</b>
Fines	4.1%	2.3%	3.3%	2.6%	3.0%	1.7%	3.4%	2.1%
Other Inorganics	0.8%	0.6%	3.5%	1.5%	2.6%	1.3%	2.3%	1.1%
<b>INORGANIC TOTALS</b>	<b>4.9%</b>	<b>2.9%</b>	<b>6.8%</b>	<b>4.1%</b>	<b>5.6%</b>	<b>2.9%</b>	<b>5.7%</b>	<b>3.2%</b>
<b>OTHER WASTE</b>	<b>0.8%</b>	<b>0.2%</b>	<b>0.6%</b>	<b>0.1%</b>	<b>2.1%</b>	<b>0.4%</b>	<b>0.6%</b>	<b>0.1%</b>
<b>SORT TOTALS</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

TABLE 22-8



Kirksville Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	567,877
Total Sample Weight (lbs)	5538.7
Significance Test Results	.000
Number of Samples Collected	38
Mean Sample (lbs) and Confidence Interval (95%)	240.09 (+/-) 29.05

Kirksville "Other Waste" Summary			
Over-the-counter Medication (OTC)	24	Beauty/Hygiene Aerosol Products	5
Prescription Medication (Rx)	1	Household Cleaning Aerosol Products	1
Beauty/Hygiene Products	18	Gardening/Yard Care Products	0
Household Cleaning Products	1	Pet Groom Products	0
Sharps/Blades	8	Disposable Razors	18
Syringes	20	Alkaline Batteries	44
Hardware/Shop Products	5	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	2		
Miscellaneous items: 1 set of acrylic paints, 1 compressed fire detector.			
Total Weight (lb): 22.6			
Total Volume (cubic ft.): 1.35			



## Chapter 23: Foristell

### COMMUNITY PROFILE

The City of Foristell is located in St. Charles County on the eastern side of Missouri. It is part of the East Central Missouri Solid Waste Management District (District I). Foristell is located off of I-70 close to St. Louis and is a relatively small and rural. The Waste Management of St. Louis Transfer Station is located west of Foristell and has a steady flow of traffic due to the towns around the St. Louis metroplex area. Foristell is approximately 44.1 miles west of St. Louis, 199 miles northeast of Springfield, and 193 miles east of Kansas City.

#### Demographics:

	<b>Foristell</b>	<b>St. Charles County</b>
Area (sq. miles)	2.34	561.35
Population (1990)	114	212,907
Density (per sq. mile)	48.75	379.28
Pop. Change since 1980	-9.5%	47.7%
Number of households	48	74,402
Persons per household	2.40	2.83
High school graduates	31.6%	32.7%
Median Family Income	\$27,083	\$44,634
Percent below poverty level	7.0%	4.7%



### **Solid Waste Collection**

Most of the cities in St. Charles County and the surrounding counties are contracted with private haulers (Waste Management and Love's Trash Service). Most rural communities are not contracted. There is no zoning or territories for haulers. Curbside recycling is done on a voluntary basis by Waste Management.

### **Solid Waste Disposal**

Waste Management of St. Louis Transfer Station accepts waste from St. Charles County and the surrounding areas. The transfer station receives approximately 57,531 tons of waste per year and the current gate tipping fee is \$9.50 per company packer.

### **Waste Reduction and Recycling Programs**

There are 9 drop-off recycling centers located in District I. These drop-offs collect aluminum, corrugated cardboard, plastics #1 and #2, phone books, magazines, ferrous cans, and newsprint. Waste Management also collects recyclables. Most cities (excluding rural towns) have some form of voluntary curbside recycling.

### **Waste Management of St. Louis Results**

Information about sample size and composition are listed in tables 23-1 to 23-8.

**All weights are listed in pounds and all volumes are in cubic feet.**



## **SORT #1**

### **Sort Conditions**

The first sort was conducted March 31- April 1, 1997. A grassy site across from the tipping floor was selected as the sort location. The weather was mild and sunny.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	1,018,092
<b>Total Sample Weight (lbs)</b>	2444.9
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	1	<b>Beauty/Hygiene Aerosol Products</b>	0
<b>Prescription Medication (Rx)</b>	2	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	3	<b>Gardening/Yard Care Products</b>	0
<b>Household Cleaning Products</b>	3	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	6
<b>Syringes</b>	12	<b>Alkaline Batteries</b>	11
<b>Hardware/Shop Products</b>	2	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> 1 container of fluorescent glue, 11 containers of acrylic paints.			
<b>Total Weight (lb): 9.2</b> <b>Total Volume (cubic ft.): 1.0</b>			



# WASTE MANAGEMENT OF ST. LOUIS (FORISTELL)

## SORT # 1

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	213.3	40.2	100%	0%	Curbside/Drop-off	Montgomery City
2	211.7	43.7	100%	0%	Curbside/Drop-off	Montgomery City
3	220.7	55.3	100%	0%	Curbside/Drop-off	Warrenton
4	183.3	48.7	100%	0%	Curbside/Drop-off	Warrenton
5	213.4	42.5	100%	0%	Curbside/Drop-off	Troy
6	211.3	42.7	60%	40%	Curbside/Drop-off	Wright City
7	149.8	42.5	100%	0%	Curbside/Drop-off	Warrenton
8	197.2	51.6	100%	0%	Curbside/Drop-off	Warrenton
9	221.2	51.1	100%	0%	Curbside/Drop-off	Wentzville (rural)
10	213.5	50.9	100%	0%	Curbside/Drop-off	Wentzville (rural)
11	215.4	46.1	100%	0%	Curbside/Drop-off	Wentzville (rural)
12	194.5	41.9	100%	0%	Curbside/Drop-off	Warrenton
<b>TOTALS</b>	<b>2444.9</b>	<b>557.2</b>				
<b>AVERAGE</b>	<b>203.7417</b>	<b>46.4</b>	<b>97%</b>	<b>3%</b>		

TABLE 23-1



**WASTE MANAGEMENT OF ST. LOUIS (FORISTELL) SORT # 1**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	156.1	51.5	13.0	4.3	6.38%	9.24%
Newsprint	169.6	30.0	14.1	2.5	6.94%	5.38%
Magazines	84.4	10.7	7.0	0.9	3.45%	1.92%
High Grade	72.0	16.0	6.0	1.3	2.94%	2.87%
Mixed	341.9	93.4	28.5	7.8	13.98%	16.76%
<b>PAPER TOTALS</b>	<b>824.0</b>	<b>201.6</b>	<b>68.7</b>	<b>16.8</b>	<b>33.70%</b>	<b>36.17%</b>
Clear	62.0	6.8	5.2	0.6	2.54%	1.22%
Brown	39.2	4.3	3.3	0.4	1.60%	0.77%
Green	27.8	2.0	2.3	0.2	1.14%	0.36%
Other	16.4	2.2	1.4	0.2	0.67%	0.39%
<b>GLASS TOTALS</b>	<b>145.4</b>	<b>15.3</b>	<b>12.1</b>	<b>1.3</b>	<b>5.95%</b>	<b>2.74%</b>
Alum. Cans	40.4	12.3	3.4	1.0	1.65%	2.21%
Other Alum	25.2	5.8	2.1	0.5	1.03%	1.04%
Non ferrous	6.0	0.5	0.5	0.0	0.25%	0.09%
Food Cans	77.3	15.0	6.4	1.3	3.16%	2.69%
Ferrous	26.4	3.6	2.2	0.3	1.08%	0.65%
Oil Filters	3.2	0.5	0.3	0.0	0.13%	0.09%
<b>METAL TOTALS</b>	<b>178.5</b>	<b>37.7</b>	<b>14.9</b>	<b>3.1</b>	<b>7.30%</b>	<b>6.76%</b>
PET # 1	52.0	17.3	4.3	1.4	2.13%	3.10%
HDPE # 2	50.8	23.0	4.2	1.9	2.08%	4.13%
Film	98.3	56.0	8.2	4.7	4.02%	10.05%
Other Plastic	231.0	92.0	19.3	7.7	9.45%	16.51%
<b>PLASTIC TOTALS</b>	<b>432.1</b>	<b>188.3</b>	<b>36.0</b>	<b>15.7</b>	<b>17.67%</b>	<b>33.78%</b>
Food Waste	505.0	50.2	42.1	4.2	20.66%	9.01%
Wood Waste	11.2	2.0	0.9	0.2	0.46%	0.36%
Textiles	125.8	28.2	10.5	2.4	5.15%	5.06%
Diapers	86.8	10.9	7.2	0.9	3.55%	1.96%
Other Organics	72.9	13.6	6.1	1.1	2.98%	2.44%
<b>ORGANIC TOTALS</b>	<b>801.7</b>	<b>104.9</b>	<b>66.8</b>	<b>8.7</b>	<b>32.79%</b>	<b>18.82%</b>
Fines	43.6	7.4	3.6	0.6	1.78%	1.33%
Other Inorganics	10.4	1.2	0.9	0.1	0.43%	0.22%
<b>INORGANIC TOTALS</b>	<b>54.0</b>	<b>8.6</b>	<b>4.5</b>	<b>0.7</b>	<b>2.21%</b>	<b>1.54%</b>
<b>OTHER WASTE</b>	<b>9.2</b>	<b>1.0</b>	<b>0.8</b>	<b>0.1</b>	<b>0.38%</b>	<b>0.18%</b>
<b>GRAND TOTAL</b>	<b>2444.9</b>	<b>557.4</b>	<b>203.7</b>	<b>46.4</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 23-2



## **SORT #2**

### **Sort Conditions**

The second sort was conducted June 23-24, 1997. The same location was used for sort activities as the previous sort. The weather was hot and humid.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	1,018,092
<b>Total Sample Weight (lbs)</b>	3076.6
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	6	<b>Beauty/Hygiene Aerosol Products</b>	1
<b>Prescription Medication (Rx)</b>	1	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	12	<b>Gardening/Yard Care Products</b>	1
<b>Household Cleaning Products</b>	0	<b>Pet Groom Products</b>	1
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	11
<b>Syringes</b>	2	<b>Alkaline Batteries</b>	18
<b>Hardware/Shop Products</b>	12	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	0		
<b>Miscellaneous items:</b> 1 container of motor oil.			
<b>Total Weight (lb): 16.2</b>			
<b>Total Volume (cubic ft.): 1.0</b>			



# WASTE MANAGEMENT OF ST. LOUIS (FORISTELL)

## SORT # 2

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	281.8	53.1	100%	0%		
2	280.5	48.9	20%	80%	None	Montgomery City (in-town)
3	274.5	48.2	50%	50%	Drop-off	Troy (in-town)
4	233.1	50.8	50%	50%	Drop-off	Troy (in-town)
5	278.9	57.1	50%	50%	Curbside	Wentzville (in-town)
6	213.4	54.3	50%	50%	Curbside	Wentzville (in-town)
7	246	52.3	50%	50%	Drop-off/Curbside	Washington and Union
8	282.8	53.8	100%	0%	Curbside	St. Charles (in-town)
9	255.1	57.1	100%	0%	Curbside	St. Charles (in-town)
10	228.2	52.4	30%	70%	None	Marthasville (in-town)
11	241.6	50.1	20%	80%	Curbside	Wentzville (in-town)
12	261.3	57.4	20%	80%	Curbside	Wentzville (in-town)
<b>TOTALS</b>	<b>3076.6</b>	<b>635.6</b>				
<b>AVERAGE</b>	<b>256.3833</b>	<b>53.0</b>	<b>53%</b>	<b>47%</b>		

TABLE 23-3



# WASTE MANAGEMENT OF ST. LOUIS (FORISTELL) SORT # 2

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	228.0	82.5	19.0	6.9	7.41%	12.98%
Newsprint	374.8	46.5	31.2	3.9	12.18%	7.32%
Magazines	122.7	10.2	10.2	0.9	3.99%	1.60%
High Grade	135.4	24.3	11.3	2.0	4.40%	3.82%
Mixed	391.5	99.3	32.6	8.3	12.73%	15.62%
<b>PAPER TOTALS</b>	<b>1252.4</b>	<b>262.8</b>	<b>104.4</b>	<b>21.9</b>	<b>40.71%</b>	<b>41.34%</b>
Clear	99.1	8.0	8.3	0.7	3.22%	1.26%
Brown	37.0	6.4	3.1	0.5	1.20%	1.01%
Green	15.2	1.4	1.3	0.1	0.49%	0.22%
Other	15.0	1.4	1.3	0.1	0.49%	0.22%
<b>GLASS TOTALS</b>	<b>166.3</b>	<b>17.2</b>	<b>13.9</b>	<b>1.4</b>	<b>5.41%</b>	<b>2.71%</b>
Alum. Cans	42.6	19.6	3.6	1.6	1.38%	3.08%
Other Alum	20.2	7.0	1.7	0.6	0.66%	1.10%
Non ferrous	3.4	0.5	0.3	0.0	0.11%	0.08%
Food Cans	62.2	12.6	5.2	1.1	2.02%	1.98%
Ferrous	28.3	3.2	2.4	0.3	0.92%	0.50%
Oil Filters	10.5	0.5	0.9	0.0	0.34%	0.08%
<b>METAL TOTALS</b>	<b>167.2</b>	<b>43.4</b>	<b>13.9</b>	<b>3.6</b>	<b>5.43%</b>	<b>6.83%</b>
PET # 1	41.9	21.0	3.5	1.8	1.36%	3.30%
HDPE # 2	57.1	33.0	4.8	2.8	1.86%	5.19%
Film	102.2	51.0	8.5	4.3	3.32%	8.02%
Other Plastic	178.6	81.6	14.9	6.8	5.81%	12.84%
<b>PLASTIC TOTALS</b>	<b>379.8</b>	<b>186.6</b>	<b>31.7</b>	<b>15.6</b>	<b>12.34%</b>	<b>29.36%</b>
Food Waste	527.1	47.3	43.9	3.9	17.13%	7.43%
Wood Waste	11.6	1.7	1.0	0.1	0.38%	0.27%
Textiles	231.9	35.5	19.3	3.0	7.54%	5.58%
Diapers	148.2	15.7	12.4	1.3	4.82%	2.47%
Other Organics	44.5	7.4	3.7	0.6	1.45%	1.16%
<b>ORGANIC TOTALS</b>	<b>963.3</b>	<b>107.6</b>	<b>80.3</b>	<b>9.0</b>	<b>31.31%</b>	<b>16.92%</b>
Fines	66.5	10.3	5.5	0.9	2.16%	1.62%
Other Inorganics	64.9	6.8	5.4	0.6	2.11%	1.07%
<b>INORGANIC TOTALS</b>	<b>131.4</b>	<b>17.1</b>	<b>11.0</b>	<b>1.4</b>	<b>4.27%</b>	<b>2.69%</b>
<b>OTHER WASTE</b>	<b>16.2</b>	<b>1.0</b>	<b>1.4</b>	<b>0.1</b>	<b>0.53%</b>	<b>0.16%</b>
<b>GRAND TOTAL</b>	<b>3076.6</b>	<b>635.6</b>	<b>256.4</b>	<b>53.0</b>	<b>100.00%</b>	<b>100.00%</b>



### **SORT #3**

#### **Sort Conditions**

The third sort was conducted September 2-4, 1997. The same location was used for sort activities as the previous sort. The weather was sunny and humid.

<b>Statistics</b>	
<b>Estimated MSW (lbs) Collected by Site During Sampling Period</b>	1,018,092
<b>Total Sample Weight (lbs)</b>	2327.3
<b>Significance Test Results</b>	.000
<b>Number of Samples Collected</b>	12

<b>OTHER WASTE CATEGORIES</b>			
<b>Over-the-counter Medication (OTC)</b>	0	<b>Beauty/Hygiene Aerosol Products</b>	4
<b>Prescription Medication (Rx)</b>	16	<b>Household Cleaning Aerosol Products</b>	0
<b>Beauty/Hygiene Products</b>	2	<b>Gardening/Yard Care Products</b>	2
<b>Household Cleaning Products</b>	0	<b>Pet Groom Products</b>	0
<b>Sharps/Blades</b>	0	<b>Disposable Razors</b>	1
<b>Syringes</b>	17	<b>Alkaline Batteries</b>	13
<b>Hardware/Shop Products</b>	1	<b>Automobile Maintenance/Cleaning Products</b>	0
<b>Aerosol Cans</b>	4		
<b>Miscellaneous items:</b> 1 package of ice gel, 2 butane lighters.			
<b>Total Weight (lb): 8.2</b>			
<b>Total Volume (cubic ft.): 1.0</b>			



**WASTE MANAGEMENT OF ST. LOUIS (FORISTELL)**  
**SORT # 3**

Sample #	Sample Size		Composition		Recycling Activities	Collection Location
	Weight	Volume	Res.	Comm.		
1	172.9	36.6	100%	0%	None	Earth City (business park)
2	164	43.5	100%	0%	None	Earth City (business park)
3	227.5	49.4	100%	0%	Curbside/Drop-off	St. Peters and O'Fallon
4	233.6	48.6	100%	0%	Curbside/Drop-off	St. Peters and O'Fallon
5	256.9	57.7	70%	30%	None	New Florence
6	232.9	49	70%	30%	None	New Florence
7	163.5	46.9	100%	0%	Curbside	St. Charles
8	175.3	50.7	100%	0%	Curbside	St. Charles
9	124.7	43.1	100%	0%	Curbside	St. Charles
10	225.1	51.8	100%	0%	Curbside	St. Charles (trailer park)
11	189.4	47.9	80%	20%	None	Montgomery City
12	161.7	43	90%	10%	Curbside/Drop-off	Warrenton
<b>TOTALS</b>	<b>2327.5</b>	<b>567.5</b>				
<b>AVERAGE</b>	<b>193.9583</b>	<b>47.3</b>	<b>93%</b>	<b>7%</b>		

TABLE 23-5



**WASTE MANAGEMENT OF ST. LOUIS (FORISTELL) SORT # 3**

CATEGORY	TOTALS		AVERAGE		PERCENTAGE	
	wt.	vol.	wt.	vol.	Pct. by wt.	Pct. by vol.
Cardboard	172.8	65.8	14.4	5.5	7.42%	11.59%
Newsprint	241.8	35.6	20.2	3.0	10.39%	6.27%
Magazines	108.8	13.4	9.1	1.1	4.67%	2.36%
High Grade	87.3	21.7	7.3	1.8	3.75%	3.82%
Mixed	302.8	86.4	25.2	7.2	13.01%	15.21%
<b>PAPER TOTALS</b>	<b>913.5</b>	<b>222.9</b>	<b>76.1</b>	<b>18.6</b>	<b>39.25%</b>	<b>39.27%</b>
Clear	74.6	6.1	6.2	0.5	3.21%	1.07%
Brown	32.1	2.8	2.7	0.2	1.38%	0.49%
Green	16.4	1.8	1.4	0.2	0.70%	0.32%
Other	10.3	1.5	0.9	0.1	0.44%	0.26%
<b>GLASS TOTALS</b>	<b>133.4</b>	<b>12.2</b>	<b>11.1</b>	<b>1.0</b>	<b>5.73%</b>	<b>2.14%</b>
Alum. Cans	42.9	20.9	3.6	1.7	1.84%	3.68%
Other Alum	19.0	8.6	1.6	0.7	0.82%	1.52%
Non ferrous	3.0	0.2	0.3	0.0	0.13%	0.04%
Food Cans	59.1	12.8	4.9	1.1	2.54%	2.26%
Ferrous	25.1	3.2	2.1	0.3	1.08%	0.56%
Oil Filters	4.0	0.3	0.3	0.0	0.17%	0.05%
<b>METAL TOTALS</b>	<b>153.1</b>	<b>46.0</b>	<b>12.8</b>	<b>3.8</b>	<b>6.58%</b>	<b>8.11%</b>
PET # 1	41.1	22.2	3.4	1.9	1.77%	3.91%
HDPE # 2	46.2	29.1	3.9	2.4	1.99%	5.12%
Film	70.5	48.8	5.9	4.1	3.03%	8.60%
Other Plastic	162.3	77.6	13.5	6.5	6.97%	13.67%
<b>PLASTIC TOTALS</b>	<b>320.1</b>	<b>177.7</b>	<b>26.7</b>	<b>14.8</b>	<b>13.75%</b>	<b>31.30%</b>
Food Waste	363.2	37.2	30.3	3.1	15.61%	6.55%
Wood Waste	24.7	4.3	2.1	0.4	1.06%	0.76%
Textiles	122.5	23.8	10.2	2.0	5.26%	4.19%
Diapers	79.7	10.0	6.6	0.8	3.42%	1.76%
Other Organics	88.3	15.4	7.4	1.3	3.79%	2.71%
<b>ORGANIC TOTALS</b>	<b>678.4</b>	<b>90.7</b>	<b>56.5</b>	<b>7.6</b>	<b>29.15%</b>	<b>15.98%</b>
Fines	83.1	14.1	6.9	1.2	3.57%	2.48%
Other Inorganics	37.5	3.1	3.1	0.3	1.61%	0.55%
<b>INORGANIC TOTALS</b>	<b>120.6</b>	<b>17.2</b>	<b>10.1</b>	<b>1.4</b>	<b>5.18%</b>	<b>3.03%</b>
<b>OTHER WASTE</b>	<b>8.2</b>	<b>1.0</b>	<b>0.7</b>	<b>0.1</b>	<b>0.35%</b>	<b>0.18%</b>
<b>GRAND TOTAL</b>	<b>2327.3</b>	<b>567.5</b>	<b>193.9</b>	<b>47.3</b>	<b>100.00%</b>	<b>100.00%</b>

TABLE 23-6



## **SORT SUMMARY**

### **Seasonal variations**

- Paper totals (especially newsprint and cardboard) were higher for this site. This is caused by the high industry in the area and the St. Louis Dispatch (newspaper).
- Food waste was also a high category Foristell is surrounded by towns containing fast food and restaurant by Highway I-70.
- A larger amount of clothing (textiles) was discarded at this site. No particular cause was identified.

### **Sort results**

- Chart 23-1 graphically compares the three seasonal sort results and shows the average waste composition, by major category, for Foristell.
- The sample data for all Foristell waste sorts are listed on Table 23-7.
- The sort results for Foristell are listed on Table 23-8.
- The summary of statistical relevance for the Foristell sorts is located on page 372.
- The total for all “other wastes” found during the Foristell sorts is on page 372.

**All weights are in pounds and volumes are listed in cubic feet.**

Comparisons of the Foristell’s waste stream to previous studies and other communities can be found in Chapter 24.



## FORISTELL RESULTS BY WEIGHT

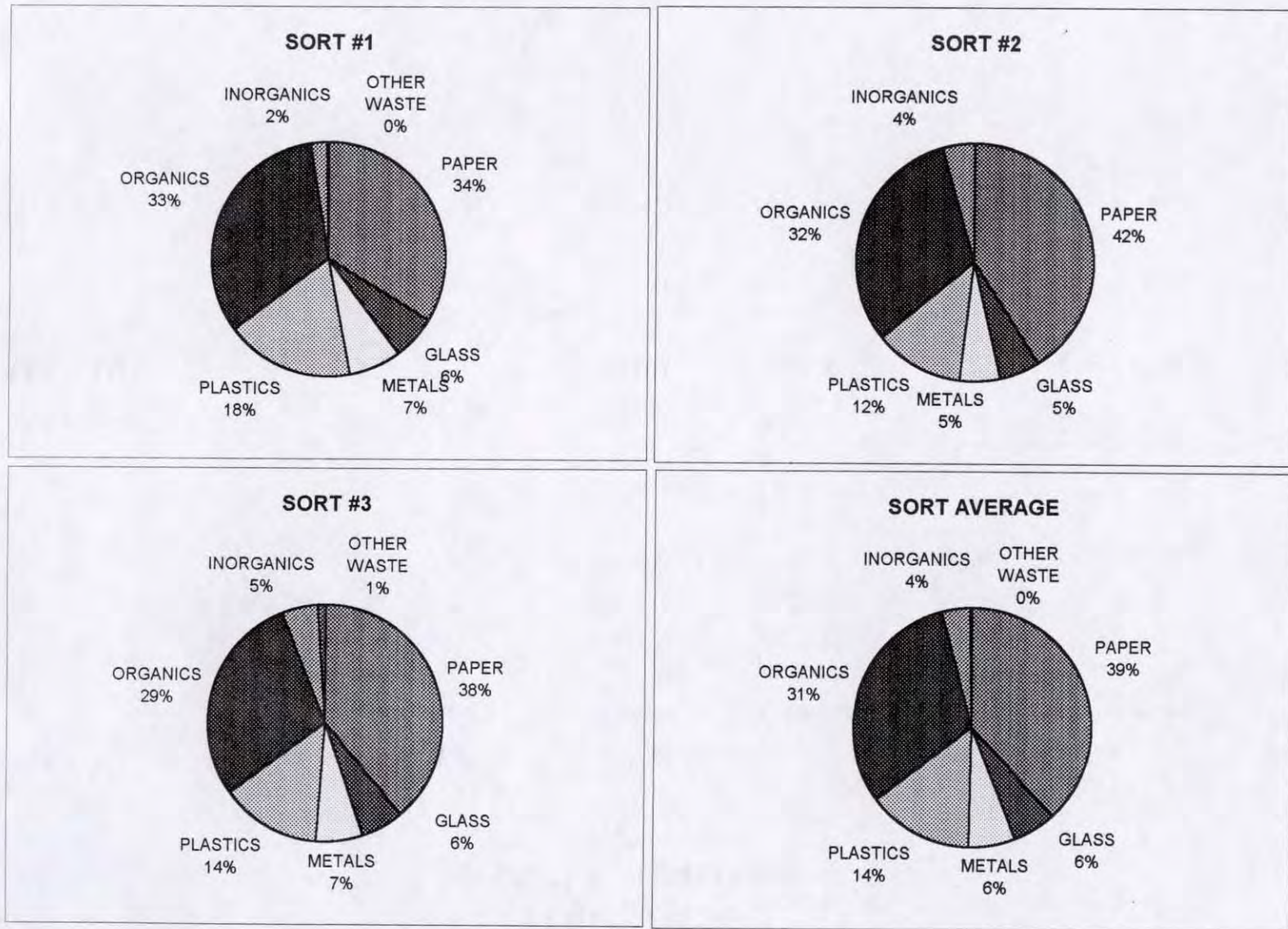


CHART 22-1



# **FORISTELL SAMPLE SUMMARY**

Sort #	Dates	Number of Samples	Sample Size		Composition	
			Weight	Volume	Residential	Commercial
1	3/31-4/1	12	2444.9	557.2	97%	3%
2	6/23-6/24	12	2327.5	567.5	93%	7%
3	9/2-9/4	12	3076.6	635.6	53%	47%
<b>TOTALS</b>		<b>36.0</b>	<b>7849.0</b>	<b>1760.3</b>		
<b>AVERAGE</b>		<b>12.0</b>	<b>2616.3</b>	<b>586.8</b>	<b>81%</b>	<b>19%</b>

TABLE 23-7

CATEGORY	FORISTELL						SUMMARY	
	SORT # 1		SORT # 2		SORT #3		AVERAGE	
	WT.	VOL.	WT.	VOL.	WT.	VOL.	WT.	VOL.
Cardboard	6.4%	9.2%	7.4%	13.0%	7.4%	11.6%	7.1%	11.3%
Newsprint	6.9%	5.4%	12.2%	7.3%	10.4%	6.3%	10.0%	6.4%
Magazines	3.5%	1.9%	4.0%	1.6%	4.7%	2.4%	4.0%	1.9%
High Grade	2.9%	2.9%	4.4%	3.8%	3.8%	3.8%	3.8%	3.5%
Mixed	14.0%	16.8%	12.7%	15.6%	13.0%	15.2%	13.2%	15.9%
PAPER TOTALS	33.7%	36.2%	40.7%	41.3%	39.3%	39.3%	38.1%	39.0%
Clear	2.5%	1.2%	3.2%	1.3%	3.2%	1.1%	3.0%	1.2%
Brown	1.6%	0.8%	1.2%	1.0%	1.4%	0.5%	1.4%	0.8%
Green	1.1%	0.4%	0.5%	0.2%	0.7%	0.3%	0.8%	0.3%
Other	0.7%	0.4%	0.5%	0.2%	0.4%	0.3%	0.5%	0.3%
GLASS TOTALS	5.9%	2.7%	5.4%	2.7%	5.7%	2.1%	5.7%	2.5%
Alum. Cans	1.7%	2.2%	1.4%	3.1%	1.8%	3.7%	1.6%	3.0%
Other Alum	1.0%	1.0%	0.7%	1.1%	0.8%	1.5%	0.8%	1.2%
Non ferrous	0.2%	0.1%	0.1%	0.1%	0.1%	0.0%	0.2%	0.1%
Food Cans	3.2%	2.7%	2.0%	2.0%	2.5%	2.3%	2.5%	2.3%
Ferrous	1.1%	0.6%	0.9%	0.5%	1.1%	0.6%	1.0%	0.6%
Oil Filters	0.1%	0.1%	0.3%	0.1%	0.2%	0.1%	0.2%	0.1%
METAL TOTALS	7.3%	6.8%	5.4%	6.8%	6.6%	8.1%	6.4%	7.2%
PET # 1	2.1%	3.1%	1.4%	3.3%	1.8%	3.9%	1.7%	3.4%
HDPE # 2	2.1%	4.1%	1.9%	5.2%	2.0%	5.1%	2.0%	4.8%
Film	4.0%	10.0%	3.3%	8.0%	3.0%	8.6%	3.5%	8.8%
Other Plastic	9.4%	16.5%	5.8%	12.8%	7.0%	13.7%	7.3%	14.3%
PLASTIC TOTALS	17.7%	33.8%	12.3%	29.4%	13.8%	31.3%	14.4%	31.4%
Food Waste	20.7%	9.0%	17.1%	7.4%	15.6%	6.6%	17.8%	7.7%
Wood Waste	0.5%	0.4%	0.4%	0.3%	1.1%	0.8%	0.6%	0.5%
Textiles	5.1%	5.1%	7.5%	5.6%	5.3%	4.2%	6.1%	5.0%
Diapers	3.6%	2.0%	4.8%	2.5%	3.4%	1.8%	4.0%	2.1%
Other Organics	3.0%	2.4%	1.4%	1.2%	3.8%	2.7%	2.6%	2.1%
ORGANIC TOTALS	32.8%	18.8%	31.3%	16.9%	29.1%	16.0%	31.1%	17.2%
Fines	1.8%	1.3%	2.2%	1.6%	3.6%	2.5%	2.5%	1.8%
Other Inorganics	0.4%	0.2%	2.1%	1.1%	1.6%	0.5%	1.4%	0.6%
INORGANIC TOTALS	2.2%	1.5%	4.3%	2.7%	5.2%	3.0%	3.9%	2.4%
OTHER WASTE	0.4%	0.2%	0.5%	0.2%	1.1%	0.5%	0.4%	0.2%
SORT TOTALS	100%	100%	100%	100%	100%	100%	100%	100%

TABLE 23-8



Foristell Statistical Summary	
Estimated MSW (lbs) Collected by Site During Sampling Period	3,054,277
Total Sample Weight (lbs)	7848.8
Significance Test Results	.000
Number of Samples Collected	36
Mean Sample (lbs) and Confidence Interval (95%)	217.09 (+/-) 13.41

Foristell "Other Waste" Summary			
Over-the-counter Medication (OTC)	7	Beauty/Hygiene Aerosol Products	5
Prescription Medication (Rx)	19	Household Cleaning Aerosol Products	0
Beauty/Hygiene Products	17	Gardening/Yard Care Products	3
Household Cleaning Products	3	Pet Groom Products	1
Sharps/Blades	0	Disposable Razors	18
Syringes	31	Alkaline Batteries	42
Hardware/Shop Products	15	Automobile Maintenance/Cleaning Products	0
Aerosol Cans	4		
Miscellaneous items: 1 container of fluorescent glue, 11 containers of acrylic paints, 1 container of motor oil, 1 package of ice gel, 2 butane lighters.			
Total Weight (lb): 33.6 Total Volume (cubic ft.): 3.0			



## Chapter 24: Summary-Phase II

Phase II of the *Missouri Waste Composition Study* examined municipal solid waste (MSW) during three seasonal waste sorts at nine landfills and transfer stations throughout the state of Missouri. The same methodology for conducting waste sorts for Phase I was also used in Phase II. A summary description of the sampling procedure can be found on page 197.

During Phase II, 282 samples were selected and the materials sorted into 26 sub-categories, plus an "other waste" category. These categories are defined in Chapter 2. After the sample was completely sorted and placed into the appropriate containers they were weighed, volumes estimated, and the data recorded.

The average sample size was 227 pounds by weight and 49 cubic feet by volume. The total weight of the samples was 63,813 pounds, and the volume was 13,671 cubic feet.

Table 24-1 indicates the number of samples examined at each location, the weight and volume of those samples, and an estimated composition of the sample.



**MISSOURI WASTE COMPOSITION STUDY  
PHASE II  
SAMPLE SUMMARY**

Location	Number of Samples	Sample Size		Composition	
		Weight	Volume	Residential	Commercial
Poplar Bluff	32	8,145	1,685	84%	16%
West Plains	34	7,384	1,623	60%	40%
Rolla	33	6,590	1,491	87%	13%
Osage Beach	32	6,797	1,517	77%	23%
Sedalia	29	6,186	1,296	70%	30%
St. Joseph	30	7,162	1,614	87%	13%
Mooreville	32	8,179	1,535	55%	45%
Kirksville	24	5,539	1,150	66%	34%
Foristell	36	7,849	1,760	86%	14%
<b>Total</b>	<b>282</b>	<b>63,831</b>	<b>13,671</b>	<b>75%</b>	<b>25%</b>

TABLE 24-1

## **Results by weight**

Table 24-2 shows the percentage of materials, by weight, found in the MSW during the three seasonal sorts. The average is based on the total weight of that material for all three sorts, divided by the total weight sorted. A description of each category is listed in Chapter 2. Chart 24-1 represents the same information in four pie charts.

The results were fairly consistent from one round to the next. Small fluctuations are mentioned in each location chapter (15-23). There were only two major changes from one seasonal sort to the next.

One change was in the “fines” category (small items too small to be separated efficiently). A change in sorting procedure at the beginning of the third round of sorts resulted in decreased accuracy for the last sort period. This decrease is a result of changing sort crews between the second and third rounds. Since the sorters were the same the first two rounds (18 sorts), their accuracy was better when determining fines from separable materials. The final crew did not have as many opportunities to increase their accuracy.

The second change was the decrease of ferrous food cans and increase in cardboard during the second round of sorts. The cardboard increase was due to higher levels of pizza boxes. This pattern may indicate that people eat out more and do less cooking in the summer months.



## PHASE II SUMMARY RESULTS BY WEIGHT

	SORT # 1	SORT # 2	SORT # 3	AVERAGE
	2/3/97-4/1/97	4/28/97-6/24/97	9/2/97-10/15/97	2/3/97-10/15/97
CATEGORY	WT.	WT.	WT.	WT.
Cardboard	6.7%	7.5%	6.6%	6.9%
Newsprint	7.1%	8.3%	8.2%	7.9%
Magazines	3.7%	3.5%	4.7%	4.0%
High Grade	4.6%	4.3%	3.6%	4.2%
Mixed	15.8%	13.7%	14.0%	14.4%
PAPER TOTALS	37.8%	37.2%	37.1%	37.4%
Clear	2.7%	3.1%	3.1%	3.0%
Brown	1.3%	1.7%	1.2%	1.4%
Green	0.6%	0.4%	0.4%	0.5%
Other	0.6%	0.4%	0.5%	0.5%
GLASS TOTALS	5.2%	5.7%	5.3%	5.4%
Alum. Cans	1.6%	1.5%	1.5%	1.5%
Other Alum	0.9%	0.7%	0.7%	0.8%
Non ferrous	0.3%	0.2%	0.1%	0.2%
Food Cans	3.5%	2.8%	3.0%	3.1%
Ferrous	0.9%	1.2%	1.3%	1.1%
Oil Filters	0.2%	0.1%	0.1%	0.1%
METAL TOTALS	7.4%	6.5%	6.7%	6.9%
PET # 1	1.9%	1.5%	1.5%	1.6%
HDPE # 2	1.9%	2.1%	2.3%	2.1%
Film	4.1%	3.9%	3.7%	3.9%
Other Plastic	7.2%	6.7%	6.4%	6.8%
PLASTIC TOTALS	15.1%	14.3%	13.9%	14.4%
Food Waste	20.0%	18.4%	19.1%	19.1%
Wood Waste	0.9%	0.7%	0.8%	0.8%
Textiles	3.0%	4.4%	4.2%	3.9%
Diapers	4.1%	3.8%	3.8%	3.9%
Other Organics	2.6%	4.1%	2.7%	3.2%
ORGANIC TOTALS	30.6%	31.5%	30.6%	30.9%
Fines	2.3%	2.4%	3.9%	2.8%
Other Inorganics	1.1%	1.5%	1.6%	1.4%
INORGANIC TOTALS	3.3%	3.9%	5.4%	4.2%
OTHER WASTE TOTALS	0.5%	1.0%	0.9%	0.8%
SORT TOTALS	100%	100%	100%	100%

TABLE 24-2

## PHASE II SUMMARY RESULTS BY WEIGHT

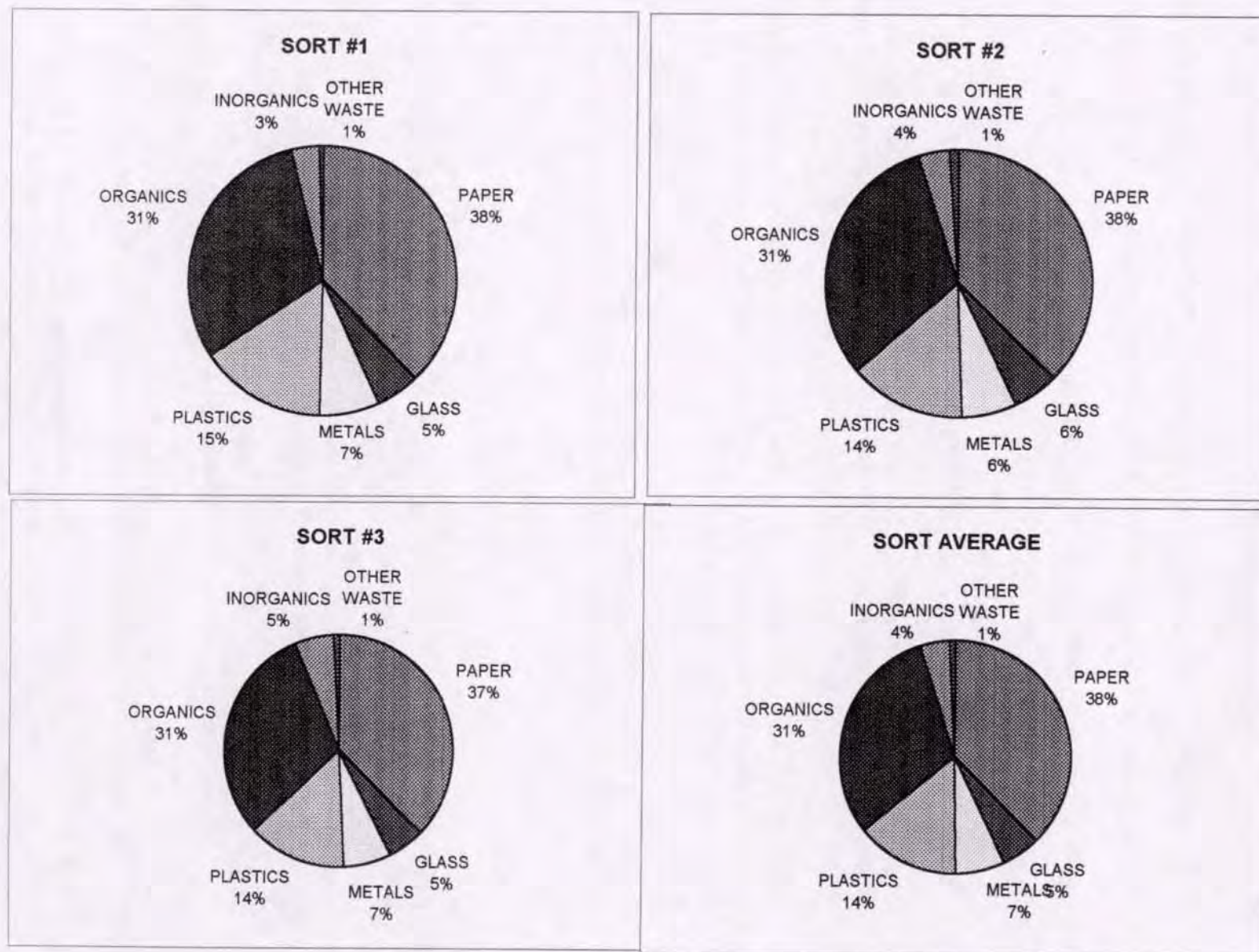


CHART 24-1



## **Comparison of waste composition among locations**

Table 24-3 lists the average composition of waste at each location. Chart 24-2 represents this information graphically for the six major categories (paper, glass, metals, plastics, organics, and inorganics). The following observations were noted during the waste sorts which may explain some of the obvious differences between sorting locations:

### **Paper**

- Osage Beach had the highest cardboard percentages (especially in the summer). This may be a result from the tourist season during the summer and the outlet mall business located in the city.
- St. Joseph has a high amount of newsprint. Since it is the fourth largest city in Missouri, the local newspaper is fairly substantial. St. Joseph is also located near Kansas City, and many samples contained both the local newspaper and the *Kansas City Star*.
- Mooresville's paper percentages were fairly high, even though there is a paper pelletizer located in Chillicothe. It was noticed that Chillicothe bags were mostly free of mixed paper, but bags from rural areas surrounding Chillicothe still contained a large amount of paper.

### **Glass**

- Mooresville had the lowest percentage of glass, probably due to the high level of recycling in Chillicothe and surrounding areas.
- Osage Beach had markedly higher levels of glass. The amount of glass increased during the summer, with more beverages containers being used (beer bottles, etc.) due to the tourists.

### **Metals**

- Kirksville had the lowest percentage of metals probably due to emphasis on metals by the local "buy back" recycling centers (scrap metals, industrial metals, cans, etc.).
- Poplar Bluff and St. Joseph had the highest metal percentages. These cities are industrial centers for their area, which could explain the higher level of metal products. However, recycling for these products are not as prevalent in these areas.

### **Plastics**

- Plastic film percentages were high in West Plains. This could be explained by the light commercial truck routes that picked up from local hotels and nursing homes.
- Mooresville had higher plastics #1 and #2 percentages than expected, even with unit-based pricing and recycling in Chillicothe. The sheltered workshop (which accepts plastics and other recyclables) does collect from surrounding communities.

### **Organics**

- Food waste is the highest percentage material at all sites.
- Poplar Bluff had the highest percentage of diapers.

### **Inorganics**

- Most of the other inorganic category was kitty litter.
- Kirksville had a high percentage of kitty litter while the University was in session, suggesting that there may be a large number of students with pet cats. This trend was also noticed at Maryville (Northwest Missouri State University) during the Phase I.



## COMPARABLE RESULTS BY LOCATION

CATEGORY	Poplar Bluff PCT. BY WT.	West Plains PCT. BY WT.	Rolla PCT. BY WT.	Osage Beach PCT. BY WT.	Sedalia PCT. BY WT.
Cardboard	6.4%	5.7%	6.9%	8.1%	7.9%
Newsprint	7.0%	4.2%	7.4%	6.7%	6.0%
Magazines	4.3%	3.7%	3.8%	3.5%	3.8%
High Grade	3.2%	8.4%	4.2%	4.4%	4.1%
Mixed	15.2%	18.2%	12.9%	12.2%	15.7%
<b>PAPER TOTALS</b>	<b>36.1%</b>	<b>40.2%</b>	<b>35.2%</b>	<b>34.9%</b>	<b>37.5%</b>
Clear	2.9%	2.3%	3.4%	4.6%	2.9%
Brown	1.2%	0.9%	1.5%	2.3%	1.2%
Green	0.5%	0.5%	0.4%	1.0%	0.3%
Other	0.9%	0.5%	0.6%	0.5%	0.3%
<b>GLASS TOTALS</b>	<b>5.5%</b>	<b>4.2%</b>	<b>5.9%</b>	<b>8.4%</b>	<b>4.7%</b>
Alum. Cans	1.5%	1.5%	1.3%	1.9%	1.7%
Other Alum	0.9%	0.5%	0.7%	0.6%	0.6%
Non ferrous	0.3%	0.3%	0.2%	0.3%	0.0%
Food Cans	4.2%	3.0%	3.4%	2.8%	3.0%
Ferrous	1.2%	0.9%	1.1%	1.0%	0.9%
Oil Filters	0.0%	0.4%	0.1%	0.1%	0.0%
<b>METAL TOTALS</b>	<b>8.1%</b>	<b>6.6%</b>	<b>6.8%</b>	<b>6.7%</b>	<b>6.2%</b>
PET # 1	1.8%	1.7%	1.6%	1.5%	1.4%
HDPE # 2	2.2%	2.0%	2.0%	1.9%	2.0%
Film	3.9%	4.8%	4.0%	3.4%	4.1%
Other Plastic	6.4%	8.3%	6.8%	6.6%	7.4%
<b>PLASTIC TOTALS</b>	<b>14.3%</b>	<b>16.8%</b>	<b>14.4%</b>	<b>13.4%</b>	<b>14.9%</b>
Food Waste	20.3%	18.5%	22.1%	20.5%	20.4%
Wood Waste	0.5%	0.8%	0.6%	0.8%	0.4%
Textiles	3.2%	2.3%	3.9%	3.5%	3.2%
Diapers	4.5%	3.3%	4.2%	3.7%	3.9%
Other Organics	2.6%	3.0%	3.0%	3.4%	3.4%
<b>ORGANIC TOTALS</b>	<b>31.1%</b>	<b>27.9%</b>	<b>33.8%</b>	<b>31.9%</b>	<b>31.3%</b>
Fines	2.8%	2.5%	2.3%	3.1%	3.0%
Other Inorganics	1.7%	1.3%	0.8%	0.9%	1.9%
<b>INORGANIC TOTALS</b>	<b>4.5%</b>	<b>3.8%</b>	<b>3.1%</b>	<b>4.0%</b>	<b>4.9%</b>
<b>OTHER WASTE</b>	<b>0.4%</b>	<b>0.3%</b>	<b>0.7%</b>	<b>0.6%</b>	<b>0.4%</b>
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

TABLE 24-3



## COMPARABLE RESULTS BY LOCATION

St. Joseph PCT. BY WT.	Mooreville PCT. BY WT.	Kirksville PCT. BY WT.	Foristell PCT. BY WT.	CATEGORY
7.6%	6.5%	6.9%	7.1%	Cardboard
12.1%	9.3%	7.7%	10.0%	Newsprint
3.6%	4.5%	4.3%	4.0%	Magazines
2.7%	4.4%	3.2%	3.8%	High Grade
13.6%	14.7%	15.2%	13.2%	Mixed
<b>39.6%</b>	<b>39.4%</b>	<b>37.3%</b>	<b>38.1%</b>	<b>PAPER TOTALS</b>
3.1%	1.8%	2.8%	3.0%	Clear
2.3%	0.5%	1.3%	1.4%	Brown
0.5%	0.2%	0.3%	0.8%	Green
0.5%	0.4%	0.5%	0.5%	Other
<b>6.4%</b>	<b>2.9%</b>	<b>4.9%</b>	<b>5.7%</b>	<b>GLASS TOTALS</b>
1.4%	1.3%	1.3%	1.6%	Alum. Cans
0.8%	0.7%	0.7%	0.8%	Other Alum
0.1%	0.3%	0.2%	0.2%	Non ferrous
3.4%	2.7%	2.7%	2.5%	Food Cans
1.5%	1.4%	0.9%	1.0%	Ferrous
0.0%	0.1%	0.2%	0.2%	Oil Filters
<b>7.2%</b>	<b>6.5%</b>	<b>6.0%</b>	<b>6.3%</b>	<b>METAL TOTALS</b>
1.6%	1.5%	1.5%	1.7%	PET # 1
2.1%	2.2%	2.3%	2.0%	HDPE # 2
3.4%	4.6%	4.4%	3.5%	Film
5.6%	6.5%	6.4%	7.3%	Other Plastic
<b>12.7%</b>	<b>14.8%</b>	<b>14.6%</b>	<b>14.5%</b>	<b>PLASTIC TOTALS</b>
19.7%	16.8%	17.9%	17.8%	Food Waste
0.8%	1.9%	0.6%	0.6%	Wood Waste
3.2%	4.2%	3.9%	6.1%	Textiles
2.8%	4.9%	5.1%	4.0%	Diapers
2.9%	3.4%	3.6%	2.6%	Other Organics
<b>29.4%</b>	<b>31.2%</b>	<b>31.1%</b>	<b>31.1%</b>	<b>ORGANIC TOTALS</b>
2.8%	3.8%	3.4%	2.5%	Fines
1.3%	1.1%	2.3%	1.4%	Other Inorganics
<b>4.1%</b>	<b>4.9%</b>	<b>5.7%</b>	<b>3.9%</b>	<b>INORGANIC TOTALS</b>
<b>0.5%</b>	<b>0.3%</b>	<b>0.6%</b>	<b>0.4%</b>	<b>OTHER WASTE</b>
<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>TOTAL</b>

TABLE 24-3



## COMPARISON OF CATEGORIES BY LOCATION

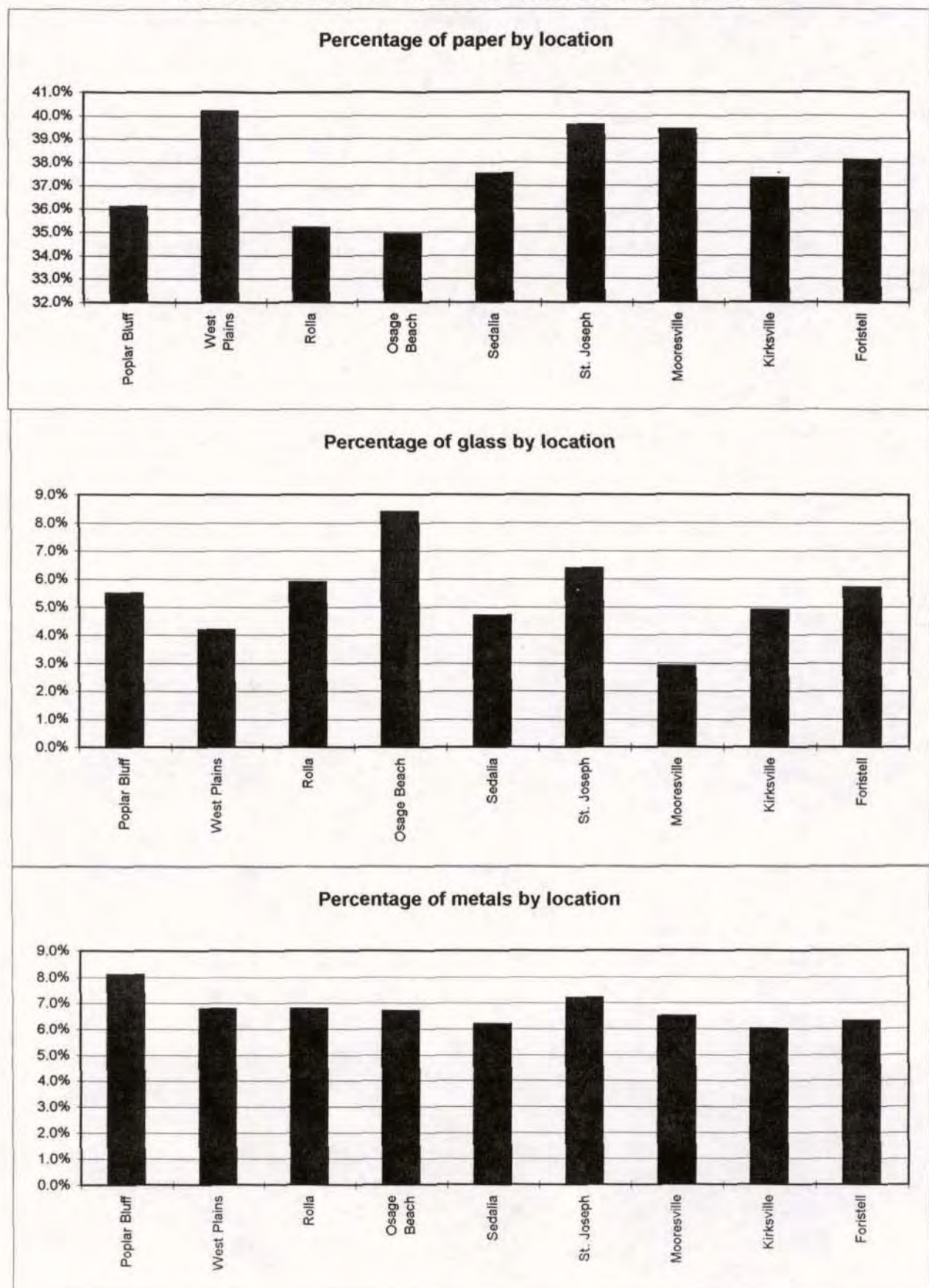


CHART 24-2

## COMPARISON OF CATEGORIES BY LOCATION

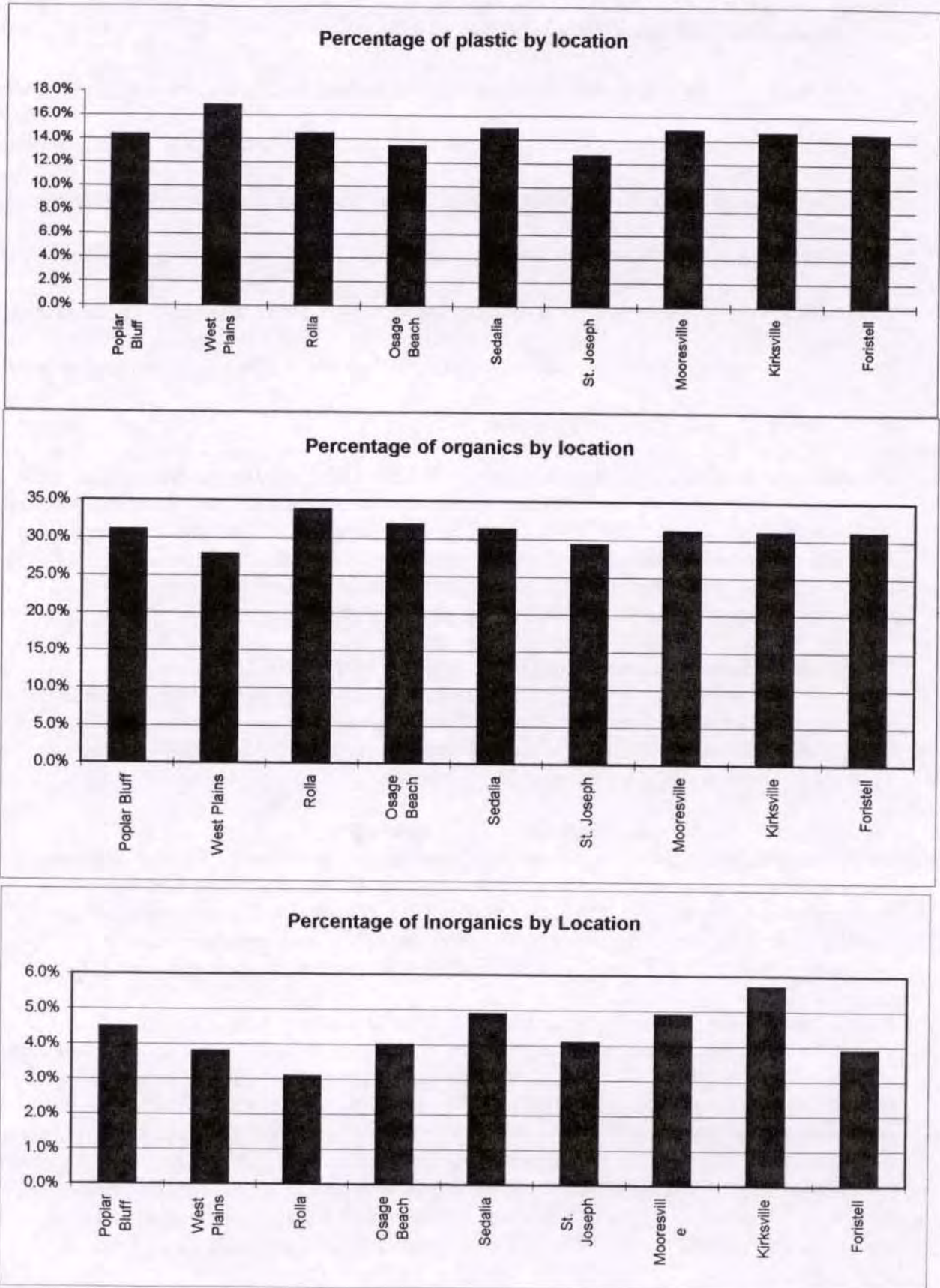


CHART 24-2



## **Comparisons to other waste composition studies**

Several waste composition studies have been conducted during the past ten years. These studies vary greatly in the type of methodology used to gather the data. Most of these waste composition studies chose different waste categories or defined their categories differently. This difference in categories makes comparisons somewhat difficult but not impossible. In some cases sub-categories were grouped together to form the major categories for comparison. The comparisons are listed in Table 24-4 and graphically portrayed on Chart 24-3. Five waste composition studies were selected for comparison with Phase II:

### ***The Missouri Statewide Resource Recovery Feasibility and Planning Study: EIERA 1987***

This was the first statewide waste composition study done in Missouri. Two seasonal sorts were conducted at four landfills. The waste sorts were performed before yard waste was banned in Missouri, therefore it is included in the other organics sub category. This comparison indicates how the Missouri waste stream has changed over the past ten years. The chart on page 11 displays the changes in the waste stream between 1987 and 1997

### ***Oregon Solid Waste Characterization and Composition 1992-93***

The study consisted of four seasonal sorts of residential and commercial waste. The waste was sorted into 83 categories, so many of those categories were combined for comparison purposes. Oregon had an extensive waste reduction and recycling program in place before, and during, the waste sorts. Yard waste was not banned from landfills and is included as other organics.

### ***The Minnesota Solid Waste Composition Study 1990-1992***

The Minnesota study was conducted by the Minnesota Pollution Control Agency. It consisted of four seasonal waste sorts conducted over a two year period. The results used on Table 13-4 are from sorts conducted in 1991-92. Samples were taken from residential and commercial waste haulers. During the year, 1,119 samples weighing 343,007 pounds were sorted. The methodology for this study was used in planning the *Missouri Waste Composition Study*.

### ***Waste Characterization Study for the City of Columbia Sanitary Landfill 1996***

This study was designed and conducted by the University of Missouri at Columbia in cooperation with the City of Columbia. Waste sorts were conducted during each of the four quarters (or seasons) of 1996 at the City of Columbia Sanitary Landfill. Weight fractions of 32 waste components were quantified from the surrounding area. To accomplish this, 127 to 151 samples, with an average weight of 306 pounds were collected each quarter. The number of samples was determined using ASTM Standard D5231-92 to achieve 80% confidence that the true weight-fraction mean would lie within 10% of the measured mean. Standard errors and percent errors were reported at the 80% and 90% confidence levels. The results on page 20 are from the



residential waste stream in the City of Columbia which is the only community in the state of Missouri with a deposit law (bottle bill) in effect.

***Characterization of Municipal Solid Waste in the United States: 1994 update***

This study was funded, and distributed by the Environmental Protection Agency. It is better known in solid waste circles as the "Franklin Study". The authors of the study, Franklin and Associates use the "material flows methodology" to determine the composition of solid waste. This methodology is based on production data (by weight) for the materials and products in the waste stream, with adjustments for imports, exports, and product lifetimes.

The Franklin study defined categories differently than other waste composition studies. Main divisions include durable goods, Non-durable goods, containers and packaging, and other wastes. Materials can be listed in one or more of these major divisions. Every effort was made to maintain accuracy and still fit the "Franklin categories" into the categories used for comparisons.

**Differences between the waste composition studies**

Comparisons between the different waste composition data is interesting. If we assume that the methodology used to conduct the study has provided accurate results, there seem to be two main components that effect the data. These two are banned items and recycling. The items that are banned from disposal in Missouri landfills are:

- Major appliances (white goods)
- Waste oil
- Lead-acid batteries
- Yard waste or clippings

The ban on yard waste seems to have a remarkable effect on reducing the amount of organic materials in the waste stream. Recycling also seems to have an effect on the composition of the waste stream. Oregon and Minnesota had strong recycling programs in effect during their waste sorts.

Table 24-5 shows a comparison of Phase I and Phase II percentage results for each category. The results were very consistent, with the exception of the glass percentages.



## COMPARISSON OF OTHER WASTE COMPOSITION STUDIES

CATEGORY	1987 EIERA	1992 Oregon	1992 Minnesota	1994 Franklin	1996 Missouri Univ. of MO	1997 Missouri WCS-Phase II
Cardboard	15.1%	6.1%	8.7%	11.1%	0.0%	6.9%
Newsprint	6.6%	4.3%	4.0%	4.3%		7.9%
Magazines	1.7%	2.5%	2.9%	2.2%		4.0%
High Grade	3.2%	3.1%	4.5%	2.8%		4.2%
Mixed	12.7%	18.3%	20.0%	17.2%		14.4%
<b>PAPER TOTALS</b>	<b>39.4%</b>	<b>34.3%</b>	<b>40.1%</b>	<b>37.6%</b>	<b>0.0%</b>	<b>37.4%</b>
Clear	3.0%	3.0%	2.0%	2.5%		3.0%
Brown	0.8%	N/A	N/A	2.4%		1.4%
Green	0.7%	N/A	N/A	0.9%		0.5%
Other	N/A	0.3%	1.1%	0.8%		0.5%
<b>GLASS TOTALS</b>	<b>4.5%</b>	<b>3.3%</b>	<b>3.1%</b>	<b>6.6%</b>	<b>0.0%</b>	<b>5.4%</b>
Alum. Cans	1.0%	0.1%	0.5%	0.4%		1.5%
Other Alum	0.5%	0.2%	0.4%	0.2%		0.8%
Non ferrous	0.1%	N/A	0.5%	N/A		0.2%
Food Cans	2.0%	2.0%	0.9%	1.0%		3.1%
Ferrous	3.5%	3.6%	2.8%	6.7%		1.1%
Oil Filters	N/A	N/A	0.1%	N/A		0.1%
<b>METAL TOTALS</b>	<b>7.0%</b>	<b>5.9%</b>	<b>5.2%</b>	<b>8.3%</b>	<b>0.0%</b>	<b>6.9%</b>
PET # 1	0.4%	N/A	0.3%	0.2%		1.6%
HDPE # 2	0.3%	N/A	0.7%	0.3%		2.1%
Film	N/A	N/A	4.7%	1.7%		3.9%
Other Plastic	7.1%	N/A	5.9%	7.1%		6.8%
<b>PLASTIC TOTALS</b>	<b>7.7%</b>	<b>7.8%</b>	<b>11.6%</b>	<b>9.3%</b>	<b>0.0%</b>	<b>14.4%</b>
Food Waste	8.3%	22.3%	13.2%	6.7%		19.1%
Wood Waste	N/A	3.9%	6.6%	6.6%		0.8%
Textiles	3.9%	2.4%	3.0%	2.4%		3.9%
Diapers	1.5%	2.2%	2.4%	1.3%		3.9%
Other Organics	21.6%	13.2%	11.0%	19.3%		3.2%
<b>ORGANIC TOTALS</b>	<b>35.3%</b>	<b>44.0%</b>	<b>36.2%</b>	<b>36.3%</b>	<b>0.0%</b>	<b>30.9%</b>
Fines	2.9%	3.0%	N/A	N/A		2.8%
Other Inorganics	2.9%	1.7%	3.8%	1.9%		1.4%
<b>INORGANIC TOTALS</b>	<b>5.8%</b>	<b>4.7%</b>	<b>3.8%</b>	<b>1.9%</b>	<b>0.0%</b>	<b>4.2%</b>
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>	<b>100.0%</b>

TABLE 24-4

# **MISSOURI WCS PHASE I AND PHASE II COMPARISONS**

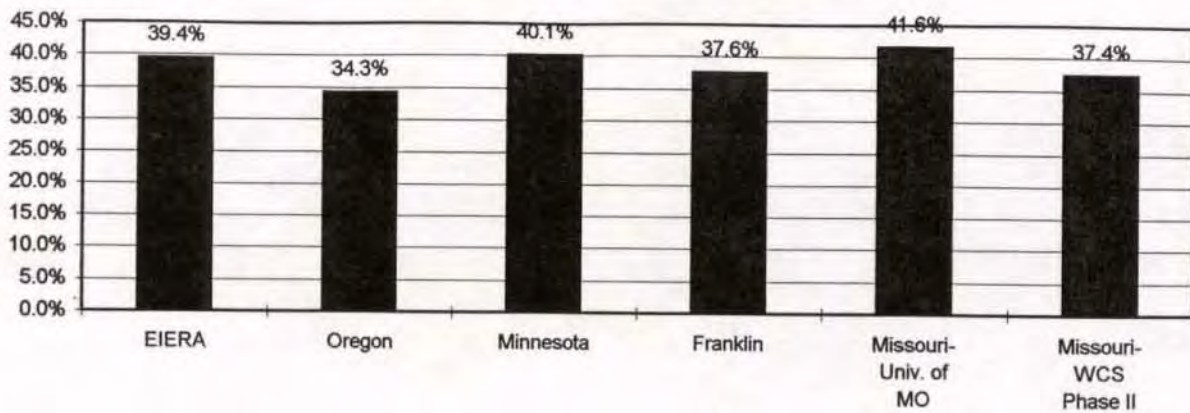
<b>CATEGORY</b>	<b>WCS-PHASE I</b>	<b>WCS-PHASE II</b>
	<b>1996</b>	<b>1997</b>
<b>Cardboard</b>	6.4%	6.9%
<b>Newsprint</b>	7.8%	7.9%
<b>Magazines</b>	3.5%	4.0%
<b>High Grade</b>	2.9%	4.2%
<b>Mixed</b>	16.2%	14.4%
<b>PAPER TOTALS</b>	<b>36.8%</b>	<b>37.4%</b>
<b>Clear</b>	3.3%	3.0%
<b>Brown</b>	1.7%	1.4%
<b>Green</b>	0.4%	0.5%
<b>Other</b>	0.7%	0.5%
<b>GLASS TOTALS</b>	<b>6.1%</b>	<b>5.4%</b>
<b>Alum. Cans</b>	1.5%	1.5%
<b>Other Alum</b>	0.8%	0.8%
<b>Non ferrous</b>	0.3%	0.2%
<b>Food Cans</b>	3.1%	3.1%
<b>Ferrous</b>	1.1%	1.1%
<b>Oil Filters</b>	0.1%	0.1%
<b>METAL TOTALS</b>	<b>6.9%</b>	<b>6.9%</b>
<b>PET # 1</b>	1.7%	1.6%
<b>HDPE # 2</b>	2.1%	2.1%
<b>Film</b>	3.5%	3.9%
<b>Other Plastic</b>	7.0%	6.8%
<b>PLASTIC TOTALS</b>	<b>14.3%</b>	<b>14.4%</b>
<b>Food Waste</b>	18.1%	19.1%
<b>Wood Waste</b>	0.8%	0.8%
<b>Textiles</b>	4.1%	3.9%
<b>Diapers</b>	4.3%	3.9%
<b>Other Organics</b>	3.3%	3.2%
<b>ORGANIC TOTALS</b>	<b>30.6%</b>	<b>30.9%</b>
<b>Fines</b>	3.6%	2.8%
<b>Other Inorganics</b>	1.6%	1.4%
<b>INORGANIC TOTALS</b>	<b>5.2%</b>	<b>4.2%</b>
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>

TABLE 24-5

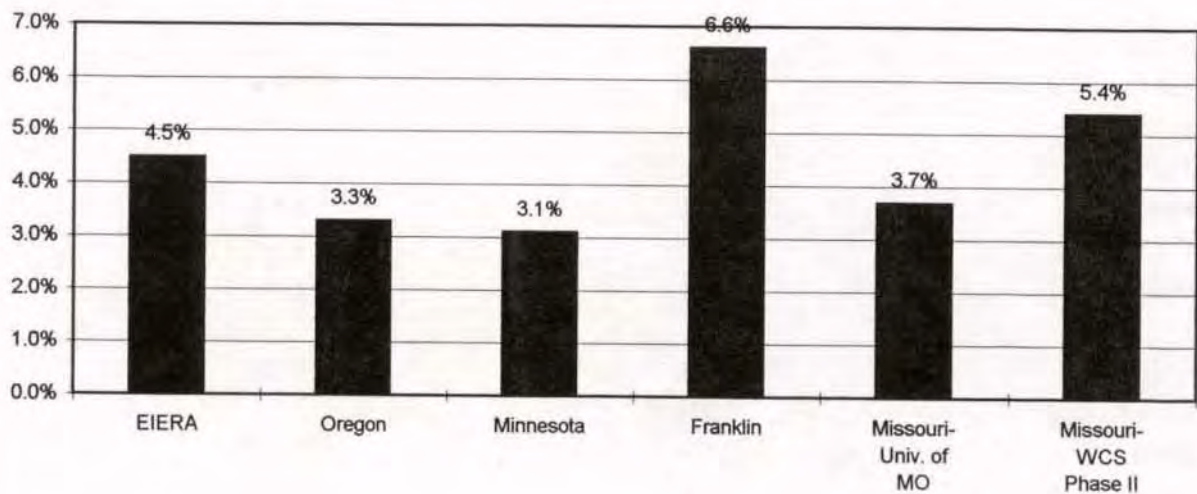


## COMPARISON OF OTHER WASTE COMPOSITION STUDIES

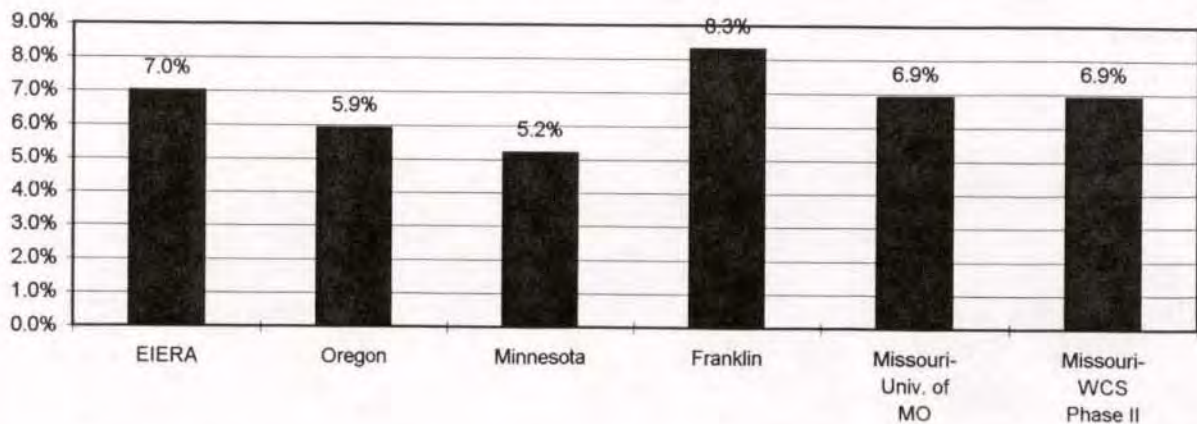
Percentage of paper in other waste composition studies



Percentage of glass in other waste composition studies

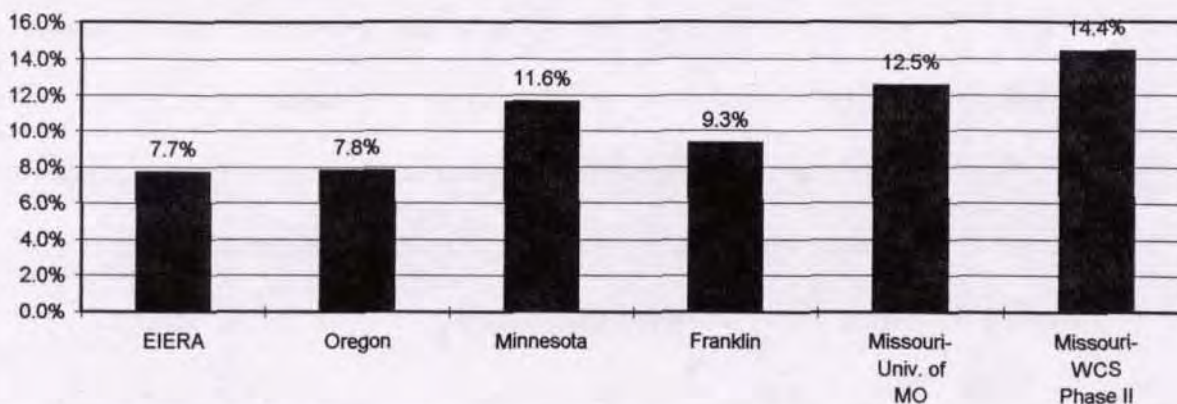


Percentage of metals in other waste composition studies

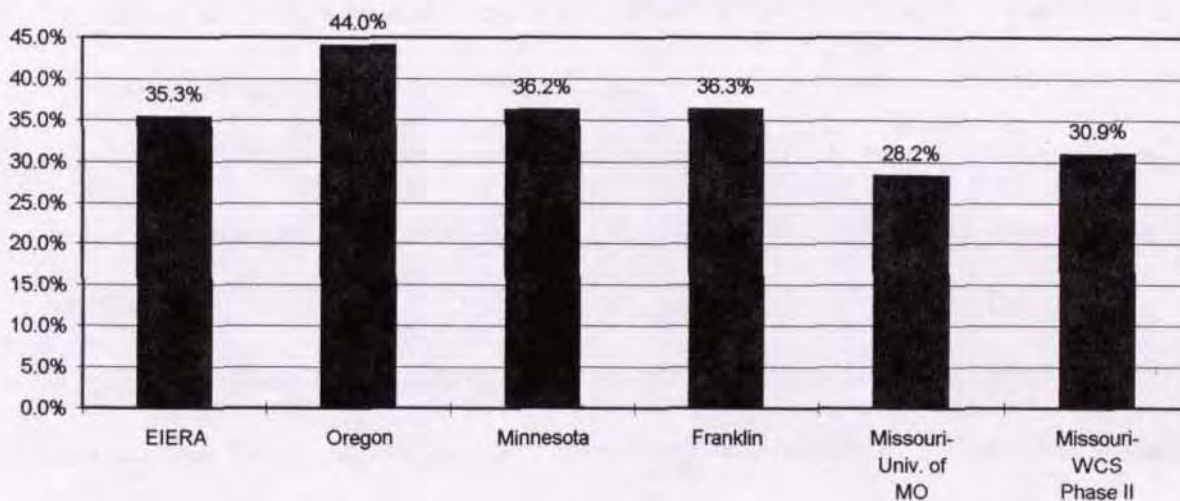


## COMPARISON OF OTHER WASTE COMPOSITION STUDIES

Percentage of plastics in other waste composition studies



Percentage of organics in other waste composition studies



Percentage of inorganics in other waste composition studies

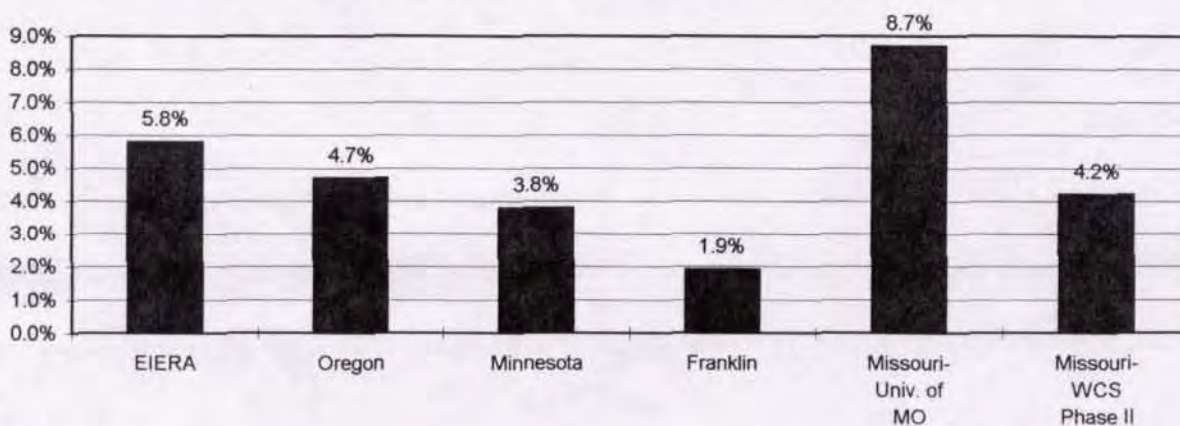


CHART 24-3



## Results by Volume

Most solid waste composition studies are recorded by weight. However, in many instances volume of the material is more significant. Some examples are calculations on landfill capacities, vehicle and storage space for recyclable materials, and compaction rates for waste haulers. This study attempted to quantify the volume of waste as well as the weight of that waste. During the sorting procedure all materials were placed in the appropriate category containers. Each identical container was three cubic feet in volume. As the container was weighed, the volume of the material within that container was estimated. Both the weight and the volume were recorded on the data sheet. The Project Manager and Sort Supervisor personally recorded and estimated the volume of all containers. This estimate is not “scientifically” accurate. However, in the process of estimating the volume of approximately 17,000 containers the waste sort personnel developed a good feel for estimating the volumes.

Table 24-6 lists the results of the Phase I waste sorts by volume and Chart 24-4 displays the same data in four pie charts. The results are somewhat expected. Paper and metal percentages are approximately the same for weight and volume. Glass, organics (especially food wastes) and inorganics were much heavier and therefore produced lower percentages of the waste stream by volume. Plastics were lighter and their volumes took up a much greater portion of the waste stream.

Table 24-7 and Chart 24-5 illustrate the relationship found between weight and volume in the Missouri waste stream. **These ratios are for uncompacted trash.** The average ratio for all materials was approximately 16 cubic yards per ton. Most conversion ratios for compacted trash is 2.5 to 4 cubic yards per ton.



## PHASE II SUMMARY RESULTS BY VOLUME

	SORT # 1 2/3/97-4/1/97	SORT # 2 4/28/97-6/24/97	SORT #3 9/2/97-10/15/97	AVERAGE 2/3/97-10/15/97
CATEGORY	VOL.	VOL.	VOL.	VOL.
Cardboard	10.9%	11.8%	11.4%	11.4%
Newsprint	5.6%	5.8%	5.7%	5.7%
Magazines	1.9%	1.9%	2.0%	1.9%
High Grade	4.3%	4.2%	3.9%	4.1%
Mixed	18.1%	16.3%	16.5%	17.0%
PAPER TOTALS	40.8%	40.0%	39.5%	40.1%
Clear	1.2%	1.1%	1.0%	1.1%
Brown	0.7%	0.8%	0.4%	0.7%
Green	0.2%	0.1%	0.2%	0.2%
Other	0.3%	0.2%	0.3%	0.3%
GLASS TOTALS	2.4%	2.3%	2.0%	2.2%
Alum. Cans	2.6%	2.8%	3.2%	2.8%
Other Alum	1.1%	1.0%	1.2%	1.1%
Non ferrous	0.1%	0.3%	0.1%	0.2%
Food Cans	3.3%	2.7%	2.8%	2.9%
Ferrous	0.6%	0.6%	0.7%	0.7%
Oil Filters	0.1%	0.0%	0.1%	0.0%
METAL TOTALS	7.8%	7.4%	8.1%	7.8%
PET # 1	3.6%	3.4%	3.9%	3.6%
HDPE # 2	4.1%	5.0%	6.1%	5.0%
Film	9.8%	8.7%	9.4%	9.3%
Other Plastic	12.9%	13.6%	13.4%	13.3%
PLASTIC TOTALS	30.4%	30.8%	32.9%	31.3%
Food Waste	9.1%	8.1%	7.3%	8.2%
Wood Waste	0.6%	0.5%	0.6%	0.6%
Textiles	2.6%	3.7%	3.2%	3.2%
Diapers	2.1%	1.9%	1.9%	2.0%
Other Organics	2.1%	2.8%	1.8%	2.2%
ORGANIC TOTALS	16.6%	17.1%	14.8%	16.2%
Fines	1.4%	1.7%	1.9%	1.6%
Other Inorganics	0.5%	0.7%	0.7%	0.6%
INORGANIC TOTALS	1.9%	2.3%	2.6%	2.3%
OTHER WASTE	0.1%	0.1%	0.1%	0.1%
SORT TOTALS	100%	100%	100%	100%

TABLE 24-6



## PHASE II SUMMARY RESULTS BY VOLUME

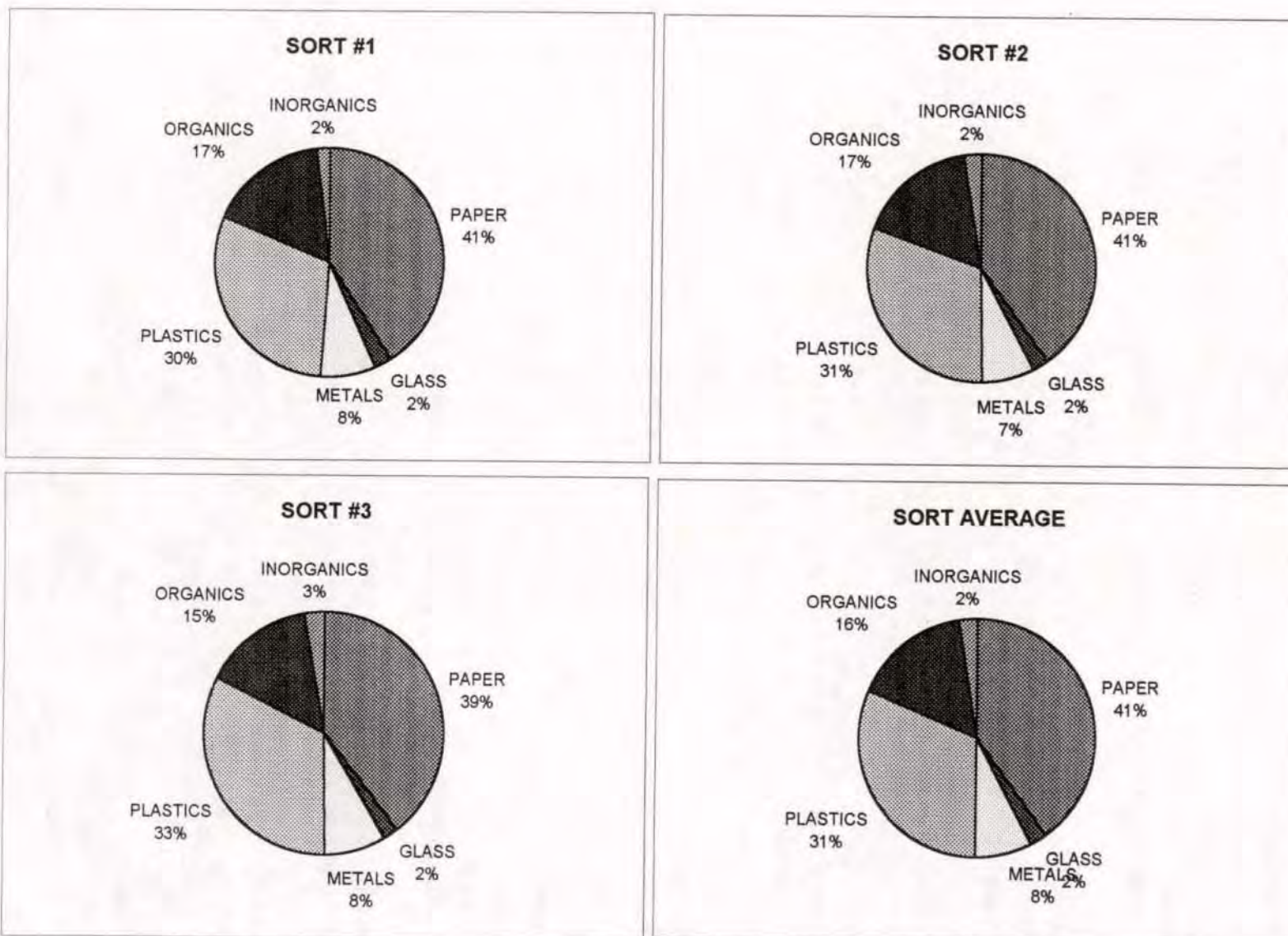


CHART 24-4

# RELATIONSHIP BETWEEN WEIGHT AND VOLUME

CATEGORY	WEIGHT IN POUNDS	PCT. BY WEIGHT	VOLUME IN CU. FT.	PCT. BY VOLUME	RATIO LBS/CU.FT.
Cardboard	4566	6.9%	1554	11.4%	2.94
Newsprint	5173	7.9%	780	5.7%	6.63
Magazines	2596	4.0%	262	1.9%	9.91
High Grade	2729	4.2%	566	4.1%	4.82
Mixed	9489	14.4%	2320	17.0%	4.09
PAPER TOTALS	24552	37.4%	5482	40.1%	4.48
Clear	1957	3.0%	153	1.1%	12.82
Brown	929	1.4%	89	0.7%	10.39
Green	308	0.5%	25	0.2%	12.22
Other	348	0.5%	39	0.3%	8.97
GLASS TOTALS	3555	5.4%	306	2.2%	11.62
Alum. Cans	1010	1.5%	389	2.8%	2.59
Other Alum	503	0.8%	152	1.1%	3.31
Non ferrous	142	0.2%	23	0.2%	6.22
Food Cans	2040	3.1%	401	2.9%	5.09
Ferrous	740	1.1%	89	0.7%	8.30
Oil Filters	83	0.1%	6	0.00%	12.95
METAL TOTALS	4517	6.9%	1061	7.8%	4.26
PET # 1	1058	1.6%	495	3.6%	2.14
HDPE # 2	1389	2.1%	690	5.0%	2.01
Film	2584	3.9%	1274	9.3%	2.03
Other Plastic	4453	6.8%	1826	13.3%	2.44
PLASTIC TOTALS	9483	14.4%	4286	31.3%	2.21
Food Waste	12546	19.1%	1121	8.2%	11.19
Wood Waste	533	0.8%	81	0.6%	6.60
Textiles	2570	3.9%	437	3.2%	5.88
Diapers	2568	3.9%	270	2.0%	9.53
Other Organics	2099	3.2%	306	2.2%	6.86
ORGANIC TOTALS	20316	30.9%	2215	16.2%	9.17
Fines	1854	2.8%	223	1.6%	8.32
Other Inorganics	905	1.4%	87	0.6%	10.45
INORGANIC TOTALS	2760	4.2%	309	2.3%	8.92
OTHER WASTE	517	0.8%	19	0.1%	27.08
SORT TOTALS	65699	100%	13677	100.0%	4.80

TABLE 24-7



## **RELATIONSHIP BETWEEN WEIGHT AND VOLUME**

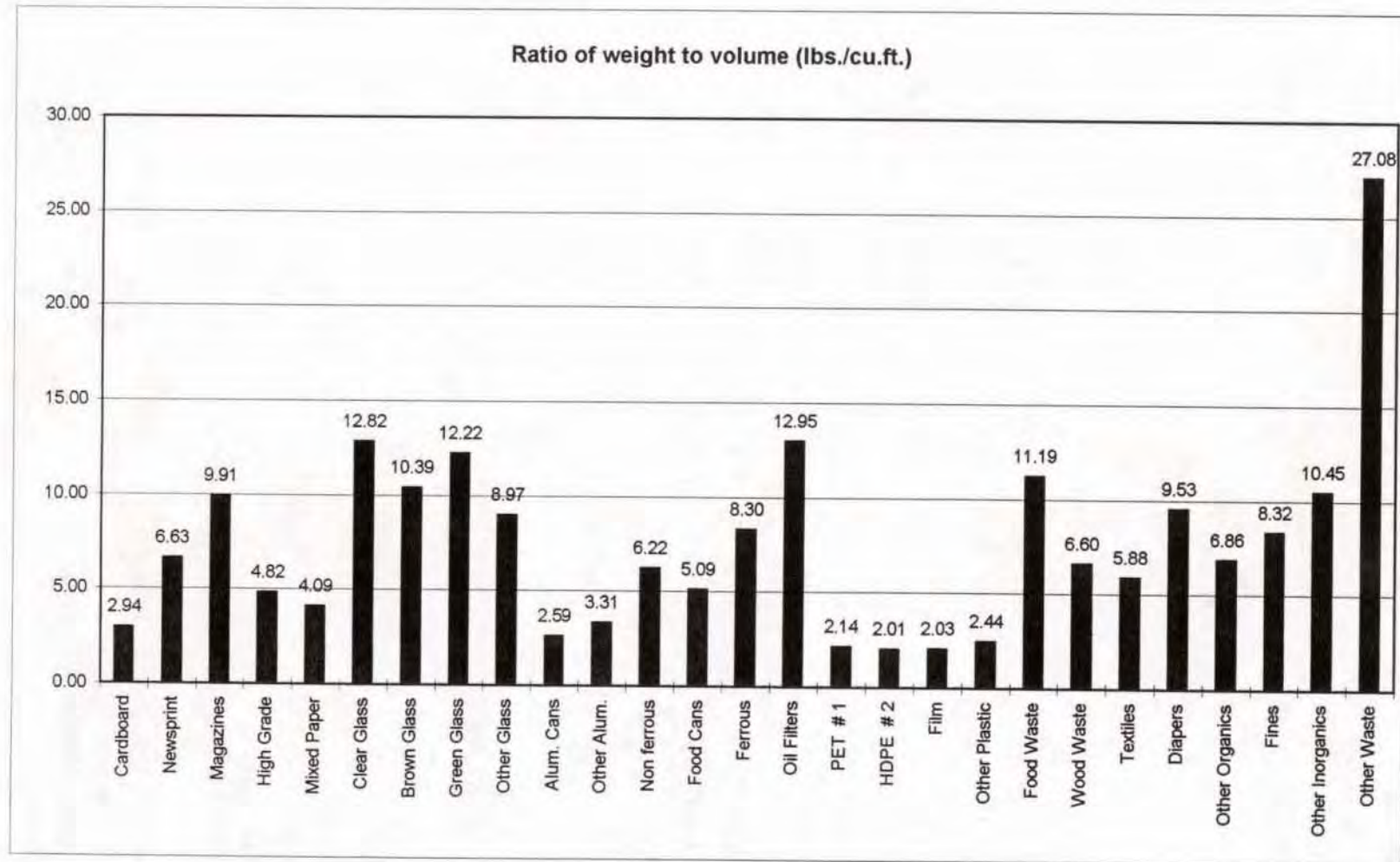


CHART 24-5